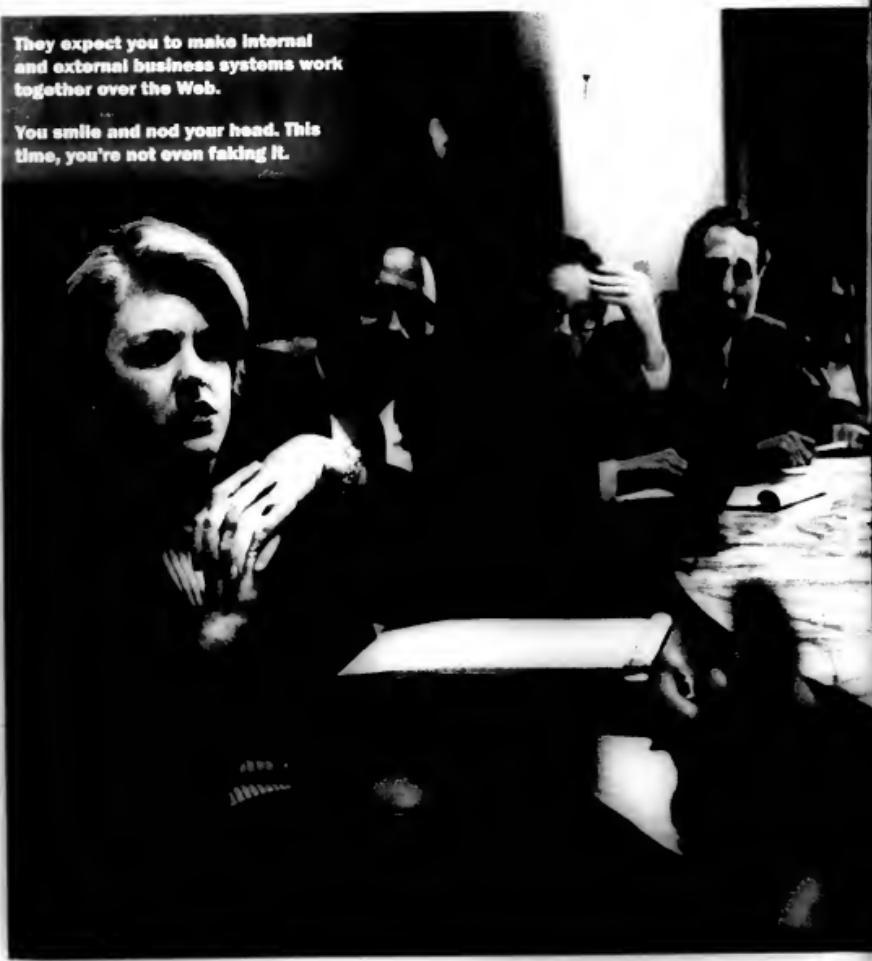


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MARKET FACT

The editors' of eWeek magazine recently gave its coveted and rare Analyst's Choice Award to Microsoft BizTalk Server 2000. The publication praised BizTalk Server 2000, calling it "an excellent platform for managing XML data processing among businesses."

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GETTING AN EDGE

The economy is cooling. Competition for jobs is heating up. Job seekers need to really make themselves stand out in the crowd. We asked two staffing experts for their advice on how to impress even the most fussy hiring manager. PAGE 21.

COMPUTERWORLD HONORS



This year's finalists are using technology to improve society, from aiding physicians in the transmission of high-resolution diagnostic images to using supercomputers and modeling software to someday predict earthquakes and volcanic eruptions. Work that's being done at Princeton by Hans-Peter Bunge (above).

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ONLINE KEEP 'EM HAPPY

Being a top employer gets a lot tougher in the midst of a cooling economy. We identify low-cost retention strategies that can have enormous paybacks.

www.computerworld.com/retainadvise

CRM MYTHS

What are the myths and what are the realities of customer relationship management? Kevin Rosen, director of the CRM practice at Silverline Technologies Ltd., outlines his views.

www.computerworld.com/crmmyths

DOES COBOL LIVE?

Columnist William Ulrich believes that Cobol remains an important part of enterprise IT strategy. Tell us your view in our discussion forum.

www.computerworld.com/cobolforum

AD-COMMERCE

It takes collaboration and effort to make a fully integrated, end-to-end advertising exchange achieve its true potential. Communities columnist Caroline Ober takes us through the process.

www.computerworld.com/adcommerce

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AT DEADLINE

Palm to Lay Off More Workers

Handheld computer maker Palm Inc., which laid off about 1,000 regular and contract workers last month, said Friday that it will make additional job cuts to further reduce internal costs. Details are due to be announced later this month. In a related matter, mobile software vendor Extended Systems Inc. is cutting its workforce by 15% in the wake of last month's collapses of a deal in which Santa Clara, Calif.-based Palm would have bought the company.

PSINet Files For Chapter 11 Protection

Telecommunications Internet service provider PSINet Inc. Friday filed it third Chapter 11 bankruptcy protection, along with 24 of its U.S. operating subsidiaries. The Ashburn, Va.-based company said four of its Canadian units are also seeking protection from creditors under Canada laws. The filings don't affect PSINet's overseas operations or its Houston-based consulting business, Metamor Worldwide Inc. (For more about PSINet, see page 10.)

Three Indicted in Lucent/China Case

On May 31, a U.S. federal grand jury indicted three men on charges of conspiring to steal Lucent Technologies Inc.'s trade secrets and sell them to a Chinese government-owned company. Charged in the one-count indictment are Hai Lin and Kai Xu, both former employees of Lucent, and Yang-Qing Cheng, who had served as a consultant to the Murray Hill, N.J.-based company. All three had worked on Lucent's Pathwork Access Server, which sends voice and data services over the Internet. Using e-mail, a password-protected Web site and visits to China, the three men conspired to steal the source code, software and the native design of the Pathwork Server, prosecutors alleged.

Digital-Rights Apps Track, Retrieve E-Mail

Small vendors offering new technology, with Lotus, Microsoft close behind

BY JENNIFER DISARIO

IF A MESSAGE DISAPPEARS after you read it, did it ever really exist? Some new technology begs the question.

A handful of small software manufacturers are selling digital-rights management software for e-mail. Users can decide how long a message remains on the recipient's desktop, if it can be forwarded or copied and even if it can be recalled after it has been sent and opened.

While the ability to retrieve or write over opened messages is available from only a few companies like Atabok Inc. in Newton, Mass., and Authentica Inc. in Waltham, Mass., other vendors like Disappearing Inc. in San Francisco provide stored encryption keys that expire at a time user specifies.

Major vendors aren't far behind. Lotus Development Corp. offers some digital-rights management features in its Notes software. These features enable senders to block recipients from forwarding, printing or copying e-mails.

Microsoft Corp.'s Outlook 2002 lets the sender retrieve mail after it has been sent.

Avoiding Unnecessary Costs

Michelle Sanger, technology manager at Landor Associates, a corporate branding firm in San Francisco, said she uses Atabok to track e-mail messages. For her, owning the messages isn't as imperative as tracking it. "When the client pays us to create a design, they own it," said Sanger. However, assurance that a document arrived on the client's desktop is a priority she explained.

"It's so easy to rely on FedEx. We're trying to get away from unnecessary costs," Sanger said.

Most people think of Napster and audio files when they consider digital-rights management, according to Joshua Dahl, an analyst at IDC in Framingham, Mass. But the potential is greater in messaging systems because the most-used Internet application is e-mail, he said.

But business and legal motivators will protect that data. Among the top concerns spurring adoption of digital-

rights management software in e-mail systems are the Health Insurance Portability and Accountability Act, vulnerable intellectual property, legal protection and privacy, Dahl said.

David Ferris, president of Ferris Research in San Francisco, agreed that there's a need, if not a demand, for this type of software despite being early in its development.

"It's still very early days for them all," Ferris said. And the software that has come out is only in its first or second version, further hindering adoption. For example, Disappe-

Sun Highlights Web Services at JavaOne

Web services will no doubt feature prominently at Sun Microsystems Inc.'s JavaOne Conference in San Francisco this week.

The new style of developing applications aims to ease content delivery to a variety of devices and across operating systems. But while Sun beats the drum for its newer initiatives, many users told Computerworld that they're still tackling old issues, such as single sign-on and code reuse, as they also contend with product updates.

Launched in February, Sun's Web services strategy, called Sun One Net Environment, is designed to enable the use of component architecture to allow applications to share functionality across the Web to disparate computing platforms, such as PCs, handheld pages and cellular phones.

A number of firms have begun to build Java-based applications that exploit Web services or are laying the underlying groundwork for such applications.

Michael Tschudk, director of Web Solutions at employee benefits provider CignaNet, a division of \$12 billion Cigna Corp. in New York, has begun using Simple Object Access Protocol and XML as a precursor to Web services. And a Web services infrastructure will

support much needed single sign-on capabilities, he said.

"The biggest issues we're facing are control security and single sign-on for users," said Tschudk, adding that the need for single sign-on has increased with the growth of Web-based applications.

"Every department has built their own applications to access business data with their own user validation information," said Tschudk.

At last year's JavaOne, which ended whether IBM had officially licensed the rights to use Sun's Java specifications, pointed back and forth between the two vendors. A month after the conference, Sun acknowledged that IBM holds a perpetual license to the technology.

But friction between the two most prominent Java vendors presented a problem for users last year and continues to pose a concern today.

"The Java language is still evolving," said Hayden Hamilton, a

JUST THE FACTS

What It Is

Atabok's ASP-based digital-rights management

■ At the user and recipient must install a plug-in to send or read mail.

■ The user decides what rights the recipient will have.

■ When the user retrieves a message, an Atabok server needs a command to the recipient's desktop and writes over the message nine times, rendering it unreadable.

ing Inc.'s product works only with the sender side, and Atabok just released its retrieval tool last week.

Analysis said that once Notes and Outlook incorporate digital-rights management tools, there will be little point using third party vendors. ■

developer at a major farm equipment manufacturer in the Midwest that uses IBM's VisualAge tools and WebSphere application server.

"One of the problems with the tools that depend on other [vendors] is products that they tend to lag behind on direct changes to Java," Hamilton said.

JavaOne, Hamilton said, "is waiting for WebSphere and VisualAge to catch up."

Chuck Grindel, a software engineer at Boston-based online health insurance claims processor Novellus Inc., contributed another to a Java-based environment and IBM's WebSphere last year but finally opted for Microsoft Corp.'s development tools instead.

"We decided to go with Microsoft, as opposed to Java," said Grindel.

The case IBM made for its Java products at JavaOne wasn't compelling enough, he added. "We don't do anything. Yet, we're using the older technology, but the platform is performing."

—Lan Copeland Glackin

NEWS

Employers Say Job Hunters Need Soft Skills, Training

Ongoing layoffs make staying sharp key in competitive market

BY JULIENNE DASH
NEW YORK

Amidst layoffs and corporate hiring freezes, job hunters need to polish their interviewing and other so-called soft skills as well as invest in technology training in order to find work, say employers and successful job hunters.

According to a report issued last week by outplacement firm Challenger Gray & Christmas Inc., dot-com firms cut 13,449 jobs in May, the second highest monthly total since the company began tracking layoffs in December 1999. April, the highest month for layoffs, saw 17,554 jobs cut.

John Challenger, the Chicago-based firm's president and CEO, said the dip in layoffs indicates that the economy is in the "latter stages of a shakeout." Many of the Internet infrastructure companies, which had until recently been insulated from the downturn, are now cutting their workforces, another indication that the layoffs are near the end.

But pink-slipped workers still face a lot of competition in the job market and can help themselves only if they come to an interview with realistic salary expectations and a dose of humility, said Rebecca Dill, executive producer at New York-based Internet consulting and design firm Drumbrecht Digital LLC. The firm has IT openings for a technical project manager and a director of technology, among other positions.

A Good Perspective

"The biggest problem we're seeing [among interviewees] is that most of the people who have been in the industry in the last three to five years have been in a bubble," she said. "The notion of what they want in a job is a lot higher than what's realistic," said Dill, who was one of about 700 attendees at a pink-slip party last week

held at Hush, a Manhattan bar.

For some positions, business skills and soft skills may be more important than technical expertise. When several applicants are competing for an IT position, the one with good communication skills will often get the job. "Interpersonal skills win over technical skills," said Keith Vencel, a product manager at Sacramento, Calif.-based Sutter Health.

The company currently has 12 IT job openings, mostly for application analysis. Because these positions involve determining end-user system requirements and end-user training, applicants need to be good listeners and attentive to customer service, said Vencel.

For instance, Vencel counts

how many times a prospective hire interrupts him during an interview. Vencel was among 150 attendees at the Strategic IT Staffing Conference held here last week.

Staying in the Know

Vencel also likes IT workers who have taken an active role in shaping their own careers by attending conferences and getting training in areas of technology that interest them. Proactive technologists are more likely to constantly find challenges in their jobs at Sutter and therefore stay at the company longer, he said.

But keeping your technology skills sharp is also critical when you have been laid off because "you're not using

those skills daily," said Bill DeCastro, who will begin working this week as a senior application developer at EquiServe LP, a Jersey City, N.J.-based provider of corporate shareholder services. The 26-year-old was laid off in February from his job as an IT consultant at Sumitomo Bank, now part of Tokyo-based Sumitomo Mitsui Banking Corp., and said he treated job hunting as a full-time job.

DeCastro spent a couple of evenings a week at a bookstore reading technical articles and books to keep his knowledge of database and Visual Basic programming current. DeCastro also spent several hours a day taking advantage of the free Ethernet access at the New York Public Library to search online job postings, research companies and send his résumé to recruiters and employers.

But even if you find a job, maintaining a good network of contacts is key in this economy, said DeCastro. Keep in touch with employers who interviewed you every couple of months, he advised. That way, "the next time [you're laid off], you'll have contacts," he said. ■

Bank Tries Using Automated Apps to Cut Contract Hours

Centralizing hiring process may enable better service deals

BY JULIENNE DASH
NEW YORK

Deutsche Bank AG is in the process of changing the way it selects and manages some of its contract workforce in the New York area in an effort to cut costs and reduce administrative overhead.

In January, the Frankfurt-based company installed a Web-based software system from Mountain Lakes, N.J.-based Computer Horizons Corp. that automates much of the work associated with managing contract professionals.

The system is designed to help identify consultants for specific jobs; users enter their requirements and then the sys-

tem scans a database for consultants with relevant skills. It also automates some billing and payroll processing for contractors and Deutsche Bank Vice President Bruce Dunn.

The software helps the bank compare what it pays for certain skills to market rates for similar skills. Dunn told the audience at last week's Strategic IT Staffing Conference here:

If the Computer Horizons Information Management Efficiency System (CHIMES) works well in New York, Deutsche Bank may extend it to its other U.S. offices, as well as offices in Australia and Japan, he said.

Efficiency Sought

Dunn hasn't yet determined whether the software will actually reduce the number of contractor hours Deutsche Bank pays for, but he did say its tracking and record-keeping

functions could help the company negotiate better deals with service providers.

For instance, the system is helping to centralize the contractor hiring process, so the bank will know not only billing rates but also how quickly contractors are being paid by individual managers. By arranging to pay for services within the first 30 days, Deutsche Bank could negotiate lower rates for its contractors.

Even a 5% to 10% reduction in the \$150 million the bank spends annually on IT consul-

tants and project managers would be significant savings, Dunn said.

Companies that have established benchmarks for consulting rates have a lot of negotiating leverage, especially when the economy is slow, which creates a buyer's market for consultants, said Paloma Hawry, a partner at Actors Consulting Group Inc. in Schaumburg, Ill.

In the Chicago area, for instance, rates for IT consultants have dropped by 25% as a result of the slowing economy, according to Actors President and CEO Darlene Pindowski.

But implementing software like CHIMES involves a significant cultural shift, said Kazim Isfahani, an analyst at Cambridge, Mass.-based Giga Information Group Inc.

Typically, hiring managers hire contractors they know and like, but a system that centralizes the process forces managers to do away with "rogue hiring," which might save money but could also prevent managers from hiring the specific consultants they want, said Isfahani. ■

Working at It

Some employers give this advice to job seekers:

- Keep your technical skills up to date
- Polish your interviewing, communication and other soft skills
- Maintain contacts with employers, even if they don't offer you a job
- Change your expectations for salary, benefits given the downturn

Users: SAS Future in ASP Arena Uncertain

Say CRM app integration key to success

BY MARYFRAN JOHNSON
FLORENCE

SAS INSTITUTE INC. threw its hat into the crowded ring of application service providers (ASPs) last week, announcing customer relationship management (CRM) software and services aimed at midmarket retailers that might otherwise find its high-end analytics applications too pricey or complex to manage.

But whether the rent-an-application approach can give SAS serious traction — and serious revenue — in the turbulent market for CRM software is an open question, said several users here at SeUG! IV, the SAS European Users' Group International's annual meeting.

"I think they're sticking a toe in the water," said Shaun Coyne, chief technology officer at Stamford, Conn.-based GE Capital Real Estate, one of SAS' largest customers. But, he said, "payback needs to be there early" for companies implementing CRM.

Teaming up with Plano, Texas-based Electronic Data Systems Corp., as the hosting site and Compaq Computer Corp. as the hardware provider, the Cary, N.C.-based company is offering SAS IntelliVisor for Retail at an initial sign-up cost of \$30,000, with monthly fees of \$20,000.

"In the CRM world, there's no clear leader because no one product manages across all customer channels equally well," said William Lepler, vice president of CRM at retailer The Limited Inc. in Columbus, Ohio. "If SAS can keep up the high quality of its software, they'll be successful at this. But the key differentiator will be the ease of integration, because CRM is an integration nightmare."

AMR Research Inc. in Boston recently estimated that of approximately 500 CRM vendors in the market today, about 85% will be gone by 2005. Yet CRM remains top-of-mind for many IT executives and their companies, according to a recent study from Intellivisus Corp. Inc. in Gaithersburg, Md. The analyst firm surveyed 137 companies. 80% of which were using or thinking about using CRM systems.

The combination of SAS' tool capabilities and its core strength in drawing information from any source speaks to a position on one else does," said Michael Boyd, director of

CRM at retailer Eddie Bauer Inc. in Redmond, Wash. "The way I see it, they're trying to evolve to a point where they're charging for value vs. just charging for the product."

The ability to gather and crunch valuable data about customers from multiple channels, including the Web, catalog sales or store locations, is the force fueling Web-based CRM, Boyd said. "We're just starting to understand how to use channels more effectively," he said, noting that companies often embark on costly CRM projects without understanding the underlying goals.

But the companies of size of The Limited and Eddie Bauer are unlikely customers for the ASP offering from SAS. The real targets for the Web-based

SAS Founder Defends Pricing, Return as CEO

Still very much in charge of the privately held software vendor he founded a quarter-century ago, SAS Institute Inc. CEO James Goodnight spoke with Computerworld's Marylyn Johnson last week at the Cary, N.C.-based company's international user group meeting in Florence. The discussion topics included Goodnight's plans to go public (no hurry), his views on pricing licensing fees (you get what you pay for) and how users should look at the Web (as just another sales channel).

Q: You've reshuffled top management in recent months and reexamined the CEO position. Have you got "founder's disease"? Is that inability to let someone else take charge of your company?

A: No. I'm myself before I'd let that happen. One of the reasons I left was to go to Europe and take a

break. Then I learned so much in Europe about the things we needed to do to globalize the company; I came back and started implementing those. My main focus is on truly globalizing SAS as a company. There were some personality problems [with former CEO Andre Boenert], and he's no longer there.

Q: SAS's high-end pricing is still an issue with some of your customers, who say it's reminiscent of IBM's old mainframe pricing. Do you have any place to change the company's pricing structure?

A: It's hard to find customers who don't want lower prices on anything, isn't it? Our pricing model has done very well for us and given us stability over the years.... We have a license fee structure, not a "pay once and own it forever" deal. Customers license SAS [technology] on a yearly basis, and we use the money they're sending us to improve the product and keep it up-to-date.

GOODNIGHT: "Our sales force loves the idea" of ASPs.

About 80% of our revenues come from our renewal licenses, and we're very dependent on that revenue stream. It provides a wonderful cushion, as over 99% of customers renew each year.

Q: What's the status of your plan to take SAS public?

A: Well, we're implementing Oracle Financials right now, and it's so full of bugs, it's going to take at least a year. We are moving in that direction, but you've got to be able to report your financials within 15 days of the end of the quarter, so we need a financial system in place. We never worried about that before. With 156 offices in 53 countries, it just takes a while.

Q: Are you concerned at all about conflicts between your traditional direct sales force and the new application service provider model of reselling software?

A: Our sales force loves the idea. If

Fred Gluck, director of e-commerce at the store, which mails out 40 million catalogs each year but views the Internet as a major new channel for reaching customers.

"We're good at keeping our back-end [systems] taking orders, but we're terrible at building data warehouses and dealing with extremely large amounts of data," Gluck explained. He said that at only 90 days into the new arrangement with SAS, his e-commerce operation was making better decisions about how to position products for faster sale on the company's Web site.

SAS officials said the Intellivisus product was the first in a line of industry-specific software and services packages that will be rolled out during the next year, focusing mainly on telecommunications firms, financial services, retailers and pharmaceutical companies.

MORE THIS ISSUE

For more CRM coverage, see page 14.

they can't sell the data mining software itself, then they'll sell the idea of an ASP. The thing I like about [ASP-style] solutions is that they cost a lot more. Solutions are a more sold sticker [in terms of customer retention] than the base software system is.

Q: The main focus of the announcements at this week's conference is e-commerce relationship management. Why concentrate now on such an economically weak area as Web e-commerce?

A: At a lot of these companies [attending the conference] are brick-and-mortars with catalog operations, [but they] are also making sales on the Web. They're interested in understanding their Web traffic and customer behavior better.

A lot of times, people will browse the Web and [then] go to the store to make the purchase, so there's a lot of cross-channel movement going on. The idea of buying over the Web didn't instantly catch on like everyone thought it would, but the Web survivors are the ones where the Web is just another sales channel.



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BRIEFS

FCC Commissioner Gets Sworn In

The newest member of the U.S. Federal Communications Commission has some highly relevant industry experience, given the hard times in the technology sector: The telecommunications company she just left filed for bankruptcy last month. Kathleen Q. Abernathy was sworn in last week as an FCC commissioner for a term that expires June 30, 2004. Abernathy was serving as vice president for public policy at voice and data services provider Broadband Office Inc., when President Bush tapped her to replace one of the three outgoing commissioners.

ManageWare Upgraded

Totality Corp., last week announced an upgrade to its software for managing corporate Web infrastructures. The San Francisco-managed services provider said the release, ManageWare 2.0, includes the ability to monitor 10,000 data points (up from 3,000) with its TotalWatch agents, an improved interactive user console and enhanced fault-detection and "resolution capabilities, such as a feature that informs service recovery coaches on an as-needed basis."

Citigroup Partners In E-Billing Service

Citigroup Inc., in New York last week said it will offer corporate customers the ability to route bills electronically to consumers through an online services provider, three large financial services companies. SpectraNet ERP LLC, an Atlanta-based electronic bill presentation and payment service owned by The Chase Manhattan Corp., First Union Corp. and Wells Fargo & Co., will also let consumers pay online through Citigroup's site. The start-up's service will act as an open hub for Citigroup's billing business-to-consumer unit to exchange billings, bills and payments between billing companies and consumers, through a single connection to its back-banking platform, Citibank said.

Microsoft Officially Launches Office XP

Gates claims smart tag feature could save companies millions of work hours

BY JENNIFER DIAZBARTING
NEW YORK

GOOGAAYE, CLIPPY! Hello, smart tags. With much fanfare, including rock music and flashing lights, Microsoft Corp. Chairman Bill Gates last week officially launched the latest version of his company's ubiquitous Office software, now known as Office XP.

While Microsoft didn't highlight any new features beyond what it promoted in previous versions of the product, Gates claimed that features like Office XP's smart tags could save millions of work hours because, for example, they can integrate Office, XML documents with back-end systems from the likes of SAP AG, PeopleSoft Inc. and JD Edwards & Co.

"By making Office just 10% better, we can save hundreds of

millions of man-hours," he said. Gates also touted XML as an integral part of Office XP. "We're designing all our software products from the ground up around XML," he noted.

A Hard Sell?

Selling those improvements won't be easy, according to analysts. "Most enterprises are having problems finding enough benefits to make switching from Office 2000 to Office XP compelling," said Michael Silver, an analyst at Gartner Inc. in Stamford, Conn. However, for those not yet using Office 2000, a jump to XP is advised. "About 70% of enterprises that I've spoken to that are planning migration to Windows 2000 are also going to upgrade Office," Silver said. "We're suggesting that organizations skip version."

Users should still take pre-

cautions by testing the software to make sure it's stable in a given environment before deploying, he warned.

About 245 million people worldwide use Office products, according to David Benner, group manager for Office/Exchange and product marketing at Microsoft.

Another way the company is pushing users to XP is by changing its licensing practices. Beginning Oct. 1, licenses will become more expensive for many users. Earlier this month, Microsoft acknowledged that the change would primarily affect users who don't upgrade to new releases as often as other companies do.

Silver said the shift may push sales of the new Office software, especially at a time when IT budgets are tightening.

Office XP contains the new version of Outlook, Micro-

soft's e-mail software, which has added smart tags. The new release also reportedly has better version control for Word documents. Revisions are now color-coded and automatically placed in the margins when an author merges different versions into a main document.

Office XP is tightly integrated with the SharePoint Portal system, a knowledge management tool and collaboration application. Word and Outlook look have improved integration, and Office XP now features the ability to send a document via e-mail directly from Word by clicking on a person's name. If the name is in the Active Directory or the user's Outlook address book, Word will recognize it.

And, in a glib flourish, Gates gave Clippy the paper clip, the much-maligned animated Office Assistant character, his severance package: an Office XP T-shirt. But Clippy aficionados need not fear. Though he has been publicly "fired," Clippy isn't completely gone; he's just turned off by default. ♦

Competitor Buys PSINet DSL Customers

Plans to build corporate business

BY JAMES COPE

Nearly 2,000 business customers of struggling service provider PSINet Inc. now belong to another provider, CAIS Internet Inc. in Washington announced last week that it purchased the contracts for PSINet's Digital Subscriber Line (DSL) business customers throughout the U.S. for an undisclosed price.

Ashburn, Va.-based PSINet has experienced major financial problems and said in a recent announcement that its

common and preferred stocks have lost their value and are no longer traded on exchanges. The company confirmed on Friday that it has filed for bankruptcy protection while it reorganizes.

Meanwhile, CAIS, which has traditionally provided broadband connections to hotels and multi-tenant buildings, said it plans to use its newly acquired business customers and a new name as a starting point for building a new name as a starting point for building a business that focuses on serving corporate customers.

Charlie Socci, IT manager at TransPerfect Translations Inc., a language translation firm, said his company had migrated from PSINet to CAIS. TransPerfect uses the service to connect 10 offices throughout the country to its network at its New York headquarters.

Moving from one provider to another "was a little tricky. We had some downtime," said Socci, noting that CAIS seemed more responsive than PSINet and that its customer support was far better when com-



SOCCI: Movement from one provider to another "was a little tricky."

pared with "some DSL nightmares" he has experienced with other providers. PSINet officials didn't respond to Computerworld's request for comment.

Still, there are no guarantees for CAIS. Acquiring new customers "doesn't mean they'll stay customers," said Jeannie Schauf, a senior analyst at Forrester Research Inc. in Cambridge, Mass. "Customers are obviously looking for security and stability [from service providers]. And that, she said, "could mean some defections" as users move from PSINet to CAIS.

As part of its effort to reposition its business, CAIS said it will ask its board of directors to approve changing the company's name to Ardent Communications Inc. ♦



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Joint Venture Taps Wireless To Improve Airport Services

Consultants, techies team up for wireless aviation offerings

BY LINDA ROSENCRANCE

PricewaterhouseCoopers and Hewlett-Packard Co. have joined forces to market wireless technology products and services aimed at improving the way airlines and airports operate. The companies said last week that their joint venture, called the Aviation Solution Center, will bring together people, products and services from New York-based PricewaterhouseCoopers' aviation consulting practice and an infrastructure and consulting services team from HP.

The center will focus in part on helping airports use

wireless devices to improve the effectiveness of ground, ramp and baggage-handling functions and to keep crew members informed and connected. It will also help airlines and airports use wireless technologies to better manage customer relations and improve access to customer data.

The idea for the Aviation Solution Center grew out of conversations PricewaterhouseCoopers had last year with airline CEOs, according to Richard Davey, an executive partner at the company's global aviation practice.

One of the issues the CEOs discussed is the need to partner with technology firms to



BAGGAGE HANDLING is among the airline functions the Aviation Solution Center aims to improve.

improve their operations in areas such as customer relationship management and data warehousing, he said.

But part of the problem, Davey said, is that many innovations are developed at small companies that are unable to turn their vision into reality.

"We believe the industry is ripe for a new collaboration," Davey said. "Quite pragmatically, we're working with HP to take some of the solutions it has developed to another level, like the wireless ramp HP implemented at the Hong Kong airport."

Kurt Ebenroth, a spokesman for Delta Technologies Inc. in Atlanta, which handles IT for Delta Air Lines Inc., said his company is studying the issue.

"It's difficult to say if it's something we would use. We

don't know if it is meant to replace what we're doing or augment it," he said.

Kate Rice, an analyst at PricewaterhouseCoopers Inc., a Sherman, Conn.-based online travel research firm, said that while some aspects of the Aviation Solution Center are important, such as the wireless ramp, baggage handling and crew communications, she isn't sure how much it will help one major problem airlines are facing: unhappy customers.

"The airlines have to deliver a pleasant customer experience, and they haven't done that for the past two years," Rice said. "I don't know if efficient management will help with that, but it may help with the timeliness problem."

HP had been in negotiations to acquire PricewaterhouseCoopers, but the deal fell through in November. Since then, HP has expanded its IT outsourcing collaboration with Chicago-based consulting firm Accenture (formerly Andersen Consulting) to focus on migrating clients from legacy applications to newer Web and wireless technologies. ▀

MerchantWired Rolling Out Wireless Malls for Retailers

LAN to help speed customer checkouts

BY BOB BREWSTER

Small and specialty mall retailers will be able to use wireless LAN technology to tap into the same kind of back-end inventory management and pricing application used by large department stores through a project launched last week by MerchantWired Inc. and Symbol Technologies Inc.

Symbol will help build a wireless LAN backbone in the more than 300 malls operated by a consortium of retail property companies that owns MerchantWired, according to Cole.

Cameron Cole, vice president of marketing at MerchantWired, said the companies include The Rouse Co., Simon Property Group Inc., Taubman Centers Inc. and Urban Retail Properties Co.

Symbol, in Holtsville, N.Y., will also provide the retailers with wireless devices that are equipped with bar-code scanners and credit card readers to manage inventory and process checkouts, Cole said.

The wireless network, in turn, will be tied to back-end computer systems that are operated by MerchantWired at its headquarters in Indi-

anapolis. According to the companies, these systems will host applications developed by Symbol and other application service providers, which will provide small retailers with the same computing horsepower and applications used by large department store chains.

Frank Riso, Symbol's director of marketing for retail and logistics, said the new wireless system will make it easy for

small retailers to access the kinds of applications that they do not have the resources to develop on their own.

Cole called the ability to remotely process checkouts over a wireless LAN a "line-busting" technique that will provide specialty retailers with the technology to quickly serve customers at crunch times, such as during the December holiday season.

Peter Jarich, an analyst at The Strategis Group Inc. in Washington, said the wireless network MerchantWired and Symbol plan to develop "opens up a lot of opportunities to provide interesting applications." He added that the wireless checkout application should "clean up a major inconvenience for retailers at peak business times."

Although the wireless LANs are primarily intended to serve small merchants, Cole said they could also be adapted to provide high-speed public Internet access service to mall shoppers who are equipped with handhelds or laptop computers that are capable of wireless connections. "This would allow a mall operator with a value-added, revenue-generating service," he said.

Riso said retailers can select the wireless device best suited to their requirements because Symbol offers wireless access

devices that run on DOS, Palm and Windows CE operating systems.

MerchantWired and Symbol intend to pilot the wireless LAN system in 10 malls this summer and roll it out later to the other properties owned by MerchantWired's backers. ▀

■ Installations are planned at more than 300 properties nationwide.

■ The wireless LAN infrastructure is focused on small and specialty retailers.

■ The MerchantWired/Symbol partnership provides connectivity and apps such as inventory control, and POS and credit card readers based on DOS, Palm OS or Windows CE.

■ The mobile wireless network could be used as a public Internet access service for shoppers.

MORE ONLINE

For more information about wireless e-commerce:
■ www.computerworld.com
■ www.merchantwired.com

■ www.symbol.com
■ www.simon.com
■ www.aurum.com
■ www.taumancenter.com

BRIEFS

Cisco Sells Off Optical Manufacturing Unit

Cisco Systems Inc., in cost-cutting mode after reporting a \$2.7 billion net loss for its last quarter, has sold off some optical networking production operations to South Carolina-based contract manufacturing firm, **Mitsubishi Corp.** -based **Soletron Corp.** last week said it bought the Cisco operations, which manufacture optical networking modules that support dense wave division multiplexing and other technologies. Soletron said it will take over manufacturing and testing of the products for Cisco for at least the next two years and assume some new-product development responsibilities.

Web-Based Shipping Venture to Launch

United Air Lines Inc., **Respository Express Inc.**, and computer maker **Unisys Corp.** last week said they will form a joint venture to provide end-to-end integrated Internet-based freight services designed to carry freight weighing more than 70 pounds. Minority investors include **American Airlines Inc.** and **Freight Forwarding company UPI Worldwide Inc.** The venture, **Integrate Global Logistics Inc.**, in Rancho Cordova, Calif., will provide small and medium-size companies an end-to-end freight service that uses a Web-based portal and other technologies to capture a market that's currently characterized by fragmented providers, limited services and high costs, according to the companies.

Short Takes

Struggling online technology retailer CYBERIAN OUTPOST INC. in Kent, Conn., has agreed to be acquired by **PC CONNECTION INC.**, a reseller in Norristown, N.J., that markets PCs and other products through catalog, call centers and several Web sites. . . . Canadian business intelligence software vendor **CHRONOS INC.** plans to lay off about 300 people amid lower-than-expected earnings in its first quarter.

PeopleSoft Kicks Off Web-Based CRM Suite

Firm first to market with fully Net-enabled product, say analysts

BY MARC L. SONGINI

PEOPLESOFT INC.'S latest customer relationship management (CRM) rollout puts it ahead in the race for Web-enabled enterprise applications, but at the sacrifice of some functions, according to analysts.

The Pleasanton, Calif.-based software maker this week is expected to officially launch its PeopleSoft 8 CRM product as a show in Las Vegas. The software boasts full Web integration, plus a CRM package that the company acquired in last year's buyout of Santa Clara, Calif.-based **Vantive Corp.**

According to analysts, PeopleSoft 8 has both hits and misses. For example, it's the first totally Web-enabled product on the market, but it has only basic sales force automation and call center technology. The software also lacks some of the applications and configuration features for specific vertical markets that some of its competitors offer.

The field service and call center technologies are comparable to Vantive's, on which Kavita will provide small and medium-size companies an end-to-end freight service that uses a Web-based portal and other technologies to capture a market that's currently characterized by fragmented providers, limited services and high costs, according to the companies.

In addition to browser access to all its modules, PeopleSoft has built in new analytical and integration capabilities. The product comes with XML-based connectors with which users can build in access to customer data from non-CRM-based applications. The analytical components include tools to help companies do things such as evaluate who their most profitable customers are.

The Web access on PeopleSoft's sales force automation software is useful because companies with offices or cus-

tomers all over the world can use the software with only an Internet connection, according to Robert Dufresne, vice president and CTO at CGI Group Inc., a Montreal-based IT consulting service provider that has been beta-testing the product for the past month.

CGI also plans to roll out other pieces of the software throughout its international operations.

Although PeopleSoft is the first

CRM vendor with a pure Web interface, competitor and CRM market leader Siebel Systems Inc. in San Mateo, Calif., offers a wider set of functions for marketing and partner management, said Erin Kinikin, an analyst at Giga Information Group Inc. in Cambridge, Mass.

PeopleSoft 8 will reflect Vantive's strong service and support functionality, Kinikin said. For instance, the product will have the ability to

WHAT IT MEANS

PeopleSoft is shipping its PS 8 CRM product this month. It's completely Web-ready, contains analytical features to evaluate things such as who are the most profitable customers, and comes ready for integration with other enterprise applications.

Struggling CRM Vendor Closing ASP Unit

Kana refocusing on core application development efforts

BY MARC L. SONGINI

Users renting customer relationship management (CRM) applications from embattled software vendor **Kana Communications Inc.** have a month to find a new hosting firm.

Redwood City, Calif.-based Kana confirmed last week that it's pulling the plug on its application service provider (ASP) venture, dubbed Kana Online, and turning that unit's 50 customers over to business partners or other third parties. Kana Online will cease operations by the end of next month, the company said.

The plan to shut down the ASP unit follows the recent announcement of a merger between Kana and Menlo Park, Calif.-based Broadbase Software Inc., another struggling

software vendor. It also comes in the wake of a 20% workforce reduction and Kana's hiring of a new CEO earlier this year.

While Kana has reported two straight losses, including a whopping \$52.9 million first-quarter deficit on revenue of \$24.2 million, company officials said the ASP operation isn't being closed for financial reasons. Kana Online was profitable, according to Michael Bettus, the company's vice president of marketing.

But Bettus added, Kana's business model has changed in the two years since the ASP unit was originally launched as a simple e-mail response system. He said the company is now targeting more enterprise-level users than before, a strategy that doesn't lend itself to the ASP model.

Kana Online initially "was designed for upstart dot-com companies that didn't have the cash to [install software themselves] and wanted it quickly

combine data from supply-chain and human-resources applications to make spare parts and service technicians available at the same time for service calls," said Steve Bonadio, an analyst at Metas Group Inc. in Stamford, Conn.

And although the call center portion will be "rudimentary," Bonadio said he expects it to become more sophisticated over time, particularly in light of PeopleSoft's plans to add advanced connections to telephone-based applications and disconnected mobile devices.

PeopleSoft still faces a rough tumble with Siebel and an even greater battle with No. 2 player Oracle Corp., with its marketing machine, superior product configuration and e-mail management capability, Kinikin said. "The race is far from won," Kinikin said.

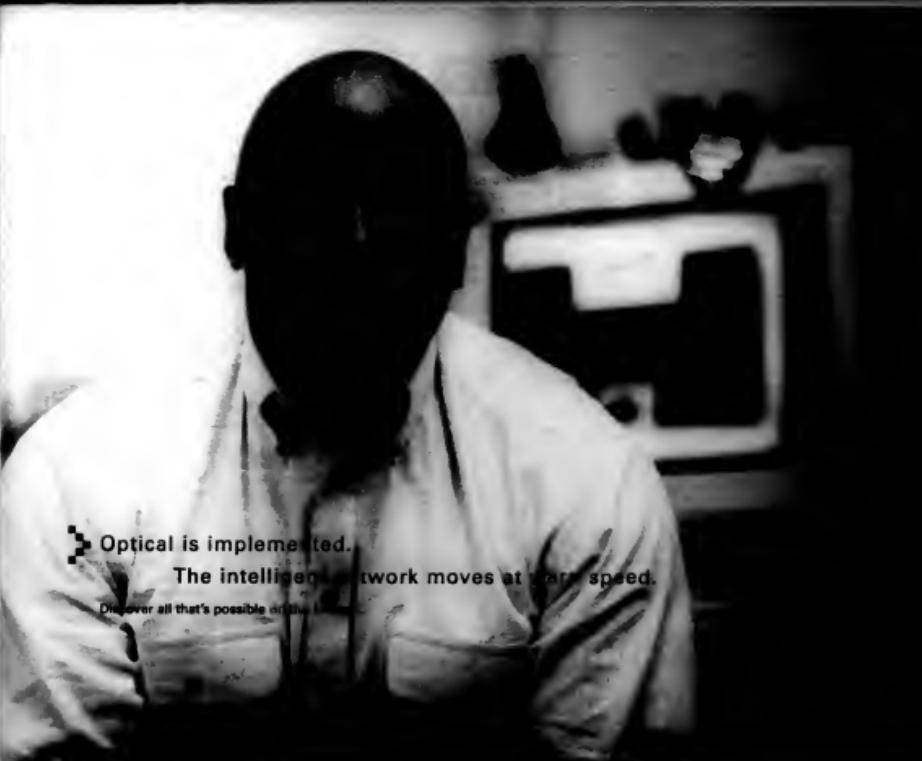
PeopleSoft 8 will ship this month and costs approximately \$100,000. ♦

up and running," he said. Some larger users looking to avoid a steep capital outlay for CRM applications also turned to Kana Online.

Kana was also busy with the Broadbase merger and the earlier acquisition of Silkenet Software Inc. in Manchester, N.H., Bettus said, and the ASP venture had become a distraction from the company's core software business.

Kana executives decided it made more sense to shift application hosting responsibilities to "companies that focus on [bring ASPs]," Bettus said.

Steve Bonadio, an analyst at Metas Group Inc. in Stamford, Conn., said the planned shutdown wasn't a big shock. "Kana has a huge amount of work ahead of it," including the completion of the Broadbase deal and a planned retooling of its entire application suite, Bonadio said. To do all that and continue running Kana Online would be "very difficult," he added. ♦



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(Continued from page 1)

Exchanges

president of business-to-business e-commerce at Delta Air Lines Inc. in Atlanta.

Wildenborg, part of the organizing team for Washington-based Gondim Inc., an online marketplace formed by major airlines and aircraft makers, said exchanges prefer charging annual or monthly subscription fees to taking money on a per-transaction basis.

"You're talking about providing a full suite of services rather than just one-off transactions," he said.

Wildenborg added that it would be hard to determine where a transaction occurred amid finance, logistics and sourcing services.

Gondim isn't alone. According to a recent electronics-marketplace study conducted by Ernst & Young LLP in New York, by next year, flat subscription fees will be the dominant revenue model used by online exchanges.

Many electronic marketplaces were formed during the past two years with revenue models aimed at gleanings up to 5% of each transaction, said Paul Penler, director of e-commerce services at Ernst & Young. That might net a handsome sum for the exchanges, he said, but the approach will ultimately prove too pricey for customers executing large transactions. And the size of some transactions defuses the purpose of exchanges that were supposed to flatten the costs of exchanging goods and services by streamlining the supply chain, he said.

"The reality is it doesn't take them any more effort, cost-infrastructurally, to do a \$100 order as compared to a \$100 million order," said Penler.

Operators of other electronic marketplaces are also reacting to customer demands to change their business models. Harvey Seegers, CEO of Global Exchange Services in Gaithersburg, Md., said the world's largest electronic data interchange (EDI) network

Changes in Store for E-Marketplaces

Some owners and operators of e-marketplaces have already worked to avoid applying transaction fees or plan to abolish them altogether.

For instance, Chicago-based consumer packaged goods exchange Transora was launched in February with a usage-based subscription fee. Rick Herbst, Transora's chief business officer, said that "transaction fees create [interoperability] costs, general and administrative [costs] for everyone involved. We're not going that route."

Covisint LLC, the Southfield,

Mich.-based exchange founded by

the Big Three automakers, offers many of its services without transaction fees, though it still charges a set fee for online auctions.

Partekos Group Ltd., an energy and utilities exchange in the Woodlands, Texas, has a \$2 transaction fee, but that won't last long.

"We've kept it low so that we won't mess it when it goes away," said Partekos CEO Graham Collins. "No one wants to pay these things, and we are going to stop charging it once the rest of our business gets us up and running."

- Michael Meenan

Paying the Middleman

Transaction fees are a common way for technology providers to charge users for the services they provide. Here are some areas where they're being applied:

EDI exchanges: Often charge per kilobacter for the passing of electronic documents from company to company.

Computer reservations systems: Charge airlines, hotels and car-rental companies for each reservation made.

Online exchanges: Have been charging nominal transaction fees as they launch, but many companies are looking to move toward subscriptions.

will have to create a different payment scheme as it expands its adjacent online marketplace.

"We'll have to move to a subscription-based fee. Customers want to pay once, not every time they do business."

The owners of online exchanges can wring only so much profit from transaction fees, regardless of the size of

the transaction, said Seegers.

By contrast, noted Wildenborg, a flat subscription fee would allow corporations to more easily measure the return on investment they would receive from participating in electronic marketplaces.

Tami Brown, manager of e-business at Xerox Corp. in Rochester, N.Y., said she doubted that her firm would enter any marketplaces that wanted to take a percentage of each sale made on the network.

"We're much more comfortable with those that have a consistent price," she said. For example, Xerox participates in Oracle Corp.'s Oracle Exchange, which charges 75 cents per transaction.

But the total costs under that model can balloon too much for some participants. For instance, office goods suppliers have razor-thin margins on their sales.

"We'd like to stay away from transaction fees altogether," said Guy Manuel, North American vice president for e-business at Corporate Express Inc. in Bloomfield, Conn.

Online catalog orders in particular are becoming commoditized, eliminating the opportunity for a middleman to make money on individual transactions, observed Delta's Wildenborg. "As companies begin to shop in these marketplaces, you're going to get significant cost pressure to keep those fees out of there," he said. ■

Covisint Exchange Vows It Will Support ebXML

Automakers' marketplace deems standard to be critical to open, global e-commerce

BY MICHAEL MEENAN

LESS THAN a month after the 1.0 version of ebXML was ratified by the OASIS and UN/CEFACT standards bodies, the infant business-to-business standard has gained key support from Covisint, the online marketplace formed by the nation's Big Three automakers.

Covisint LLC, in Southfield, Mich., last week announced that it will make the electronic-business XML specifications a central component of its automotive trading community.

Jeff Cripps, director of in-

dustry relations at Covisint, said executives at the exchange view ebXML as a critical component in helping the company form a truly global and open approach toward conducting e-commerce.

"We're looking for an invoice that can be used across industries," Cripps said. "There's a lot of these common processes which pretty much everyone in every industry can agree upon, and we think they're really getting to the heart of that."

Last month, Covisint took part in an ebXML "proof of concept" presentation in Vienna that featured demonstra-

tions of functions such as exchanging and routing documents, uploading and downloading catalogs, and submitting purchasing orders. Cripps said the success of that effort helped convince Covisint that the standard is one worth pursuing. "We've got to pound a stake in the ground and move forward here," he said. "And this is the standard we've chosen."

Covisint might have the power to move a lot of businesses with it, founded by General Motors Corp., Ford Motor Co. and DaimlerChrysler AG. The exchange and its principals have a lot of clout in the \$300 billion automotive supply chain.

"It's absolutely a significant step for ebXML," said Laura Walker, executive director of the Organization for the Ad-

vancement of Structured Information Standards (OASIS), which helped develop ebXML.

Cripps noted that Covisint has also been following earlier business-to-business standards by the Open Applications Group (OAG) and the XML Common Business Library (XCBL) and plans to urge those groups to devote their efforts with ebXML. In April, RosettaNet, which has been a popular business-to-business standard in the high-tech industry, promised to merge its messaging protocols with ebXML.

"If [the OAG and XCBL] keep going down separate paths, we're not going to end up at a global standard for messaging and document exchange," Cripps said.

He added that Covisint technology partner Commerce One Inc. played a major role in introducing the exchange to ebXML. Commerce One is currently in the process of building an ebXML gateway into its online marketplace software. ■

Continued from page 1

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Feds Charge 90 in Net Fraud Crackdown

BY PATRICK THIBODEAU
WASHINGTON

Federal law enforcement officials said they have filed charges against 90 individuals and companies involved in a host of Internet fraud schemes that have bilked approximately 56,000 people out of more than \$107 million.

The FBI, which announced the charges May 23, began making the arrests in a nationwide crackdown on Internet fraud with the cooperation of a wide range of federal, state and local law enforcement agencies.

The crimes were uncovered with the help of the National White Collar Crime Center (NWCC) and Operation Cyber Loss, a program initiated by the Internet Fraud Complaint Center, according to an FBI statement.

Launched May 8, the program is the result of a partnership between the FBI and the Washington-based NWCC.

The government organizations worked with a variety of companies, including Microsoft Corp., Palo Alto, Calif.-based PayPal Inc. and Alexandria, Va.-based The Motley Fool Inc., to identify and report violators.

Crime Still Growing

Bruce Swartz, deputy assistant attorney general, testified about Internet fraud at a U.S. House Subcommittee on Commerce, Trade and Consumer Protection hearing that was also held on May 23. Despite the arrests, he said, Internet fraud remains "one of the most pervasive and fastest-growing types of fraud we face."

The schemes were wide-ranging and included non-delivery of merchandise ordered over the Internet, unauthorized use of credit cards, offers of phone job opportunities that included application fees and fraudulent loans and investments, as well as Ponzi schemes (named for a well-known scheme artist of the 1920s) and pyramid schemes, in which investors are promised outrageously high profits.

The Internet "is a perfect medium for which fraudsters can reach a large number of people and maintain a cloak

of secrecy over their identity," said Thomas Kubic, the FBI's deputy assistant director, at the hearing. "The efforts today

are in fact a response to the perceived rise in crime and fraud on the Internet."

"The Internet gives miscreants special capabilities," said Billy Tauzin (R-La.), chairman

of the House Energy and Com-

merce Committee. "Bonnie and Clyde would have loved this environment."

Sam Costello of the IDG News Service contributed to this article.



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Report Warns Europeans About Echelon Surveillance

Urges firms, citizens to use encryption

BY DAN VERTON

AN INVESTIGATIVE committee of the European Parliament has concluded that the U.S. National Security Agency, along with the intelligence services of four other countries, operates a global electronic surveillance network code-named Echelon but that the system is less capable than previously reported.

A May 18 draft report by the European Parliament's Temporary Committee on the Echelon Interception System concludes that while the existence of the system "is no longer in doubt," analysis shows that it "cannot be nearly as extensive as some sections of the media have assumed."

Still, the committee urged European Union member states, businesses and private citizens to use encryption software whenever possible.

The report, which is scheduled to be presented to the full parliament on Sept. 4, is the

latest in a series of reports spanning four years that have looked into claims of industrial espionage and civil liberties violations stemming from the Echelon system.

Run by Australia, Canada, New Zealand, the U.K. and the U.S., Echelon is believed to be capable of capturing the vast majority of telephone, fax, e-mail and radio communications around the globe so that they can be analyzed by the intelligence services of the nations that run it. To date, officials in the U.S. have publicly disavowed any knowledge of the Echelon system.

However, in a significant reversal of the hypothesis that has surrounded much of the debate about Echelon, the EU report concludes that "the majority of communications cannot be intercepted by earth stations, but only by tapping cables or intercepting radio signals." The report goes on to state that the five nations responsible for the system "have access to only a very limited proportion of cable and radio communications and can analyze only a limited proportion of those communications."

Regardless of the limitations of the Echelon system, the committee has urged the parliament to encourage future development and greater use of open-source encryption technology by businesses and citizens in Europe.

The report also asks the EU to urge businesses to bolster their security and cooperate more closely with the intelligence and security services in Europe to uncover cases of industrial espionage.

The entire working environment must be protected, thereby guaranteeing the security of a firm's premises, and

checks must be carried out on persons entering offices and accessing computers," the report states. "If security is to be taken seriously, only those operating systems should be used whose source code has been published and checked, since only then can it be determined with certainty what happens to the data."

The report comes after several members of the Echelon committee traveled to Washington May 10 to conduct a fact-finding mission, only to be

turned away by U.S. officials.

Sources in Washington and Europe, however, said the committee members, including committee Chairman Carlos Coelha of Portugal and David Lowe, head of the secretariat for the committee, arrived without an official invitation or scheduled meetings.

"They received no invitation at all," said an intelligence expert in Europe who has testified on the Echelon system before the European Parliament and who asked to remain

anonymous. "If you are not invited at the official level, you should not be surprised if nobody is willing to receive you."

"That's the official [Bush] administration's view of what happened. But that's sort of splitting hairs," Lowe said, adding that U.S. officials pulled the plug on planned meetings only days before the committee members were scheduled to arrive.

"We did not wish to produce a report that contained a number of serious allegations unless they had an opportunity to comment," said Lowe. "This was understood when I was in Washington in March. We're rather disappointed that an opportunity was lost. As it stands now, the allegations [in the report] remain open."

BellSouth Waves SiteWand at Customer Data

ASP's service captures Web info in database

BY MARK HALL

Keric Shanahan will have a few new tools to analyze customer data with this week when his application-service provider (ASP), Instantis Inc., upgrades its SiteWand software.

The technology strategist at BellSouth Corp. in Atlanta has been using SiteWand for almost six months to evaluate how the telecommunications giant's customers interact with its e-mail help desk operations.

Shanahan said he's pleased with Instantis' new release, which includes an updated query tool that lets him search time-dependent customer contact information and another feature that lets him see real-time survey results in percentages dynamically.

Sunnyvale, Calif.-based Instantis was founded in 1999 and made SiteWand available last December. The service can take any HTML-based form on the Web, identify all the fields in the form, pass the data in the

fields to a database and link actions for the SiteWand software engine to take based on user-defined rules.

"The ability to capture incoming information on a Web site into a database is extremely interesting," said Karen Moser, an analyst at IDC in Framingham, Mass. Companies are able to immediately put the incoming data into a message and forward it to appropriate staffers or make it part of a business workflow, she said.

In BellSouth's e-commerce group, Shanahan said, customer messages are automatically sent to his attention every day so he can act on them or

forward them to the appropriate person.

Applications such as SiteWand are often low on an IT department's to-do list, said Moser. "They're more interested in not having to put another thing on their plate," she said.

As in the case at BellSouth, contracting with an ASP doesn't completely let IT off the hook because IT must make certain that the ASP is set up to protect the security of the data, added Moser.

SiteWand is one part of BellSouth's strategy to evaluate and refine its effort to get millions of customers to use the Web for customer service in lieu of expensive and extensive telephone-based help desk operations, said Shanahan.

Shanahan's group is the second inside BellSouth to use SiteWand. To date, he's been using it to conduct extensive surveys of how well the e-mail help desk has been working for customers. "We already have a ton of data on the phone center's abilities," he said.

Because the information is captured into a database, it's easy to port it into another database and run other analyses, said Shanahan. ■



A EUROPEAN PARLIAMENT committee says Echelon's capability's are "limited."

SiteWand Engine	
• Uses pay \$10,000 to \$15,000 per year for each SiteWand engine used.	• Engages an intelligent module that are customized for every user site.
• Engages customized modules that are customized for every user site.	• Engages customized modules that are customized for every user site.

EMC to Reduce Its Workforce by 1,100

Analysts applaud downsizing, other cuts

By LUCAS MEARIAN

IN WHAT THE COMPANY described as its first bona fide round of layoffs, storage industry leader EMC Corp. last week announced plans to cut its workforce by 4% through the dismissal of about 1,100 employees over the next several weeks.

The company also said it will try to boost sales by increasing the number of its quota-carrying sales and systems engineering positions, partly through a redeployment of several hundred workers who currently hold other jobs. In addition, EMC plans to reduce its use of consultants and contractors, rein in its travel budget and delay some planned facility expansion projects.

The moves come after the company twice scaled back its business forecast, warning most recently in April that financial results for the year as a whole would be lower than expected.

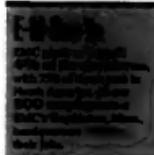
A week later, EMC reported a first-quarter showing in line with that warning, disclosing that profits totaled \$308.8 million — up from \$332 million in the same period last year but about 10% less than analysts had predicted.

The upcoming layoffs will actually be the second round of job cuts at the company this year, following the dismissal of several hundred workers in February. However, EMC officials described those dismissals as "performance management cuts" that were part of a stringent and ongoing employee review process.

About three quarters of the 1,100 layoffs will occur in North America, with 300 employees due to be let go from various groups at EMC's head-

quarters in Hopkinton, Mass. Most of the remaining job reductions will occur in Europe, the company said. The cuts will leave EMC with approximately 23,400 employees, which is about the same number it had at the beginning of the year.

EMC said the workforce reduction will eliminate "redundancies and overlaps in certain field operations," reduce the size of several corporate departments and continue a re-



duction of the workers needed to support a "managed decline" of the Unix server business the company bought as part of its 1999 acquisition of Data General Corp. The layoffs and employee redeployments

will result in a second-quarter charge of about 1 cent per share, the company noted.

Tony Prigmore, an analyst at Enterprise Storage Group Inc. in Milford, Mass., described the layoffs as a sensible response to the disappearance of numerous dot-com big spenders and the tightening of corporate IT budgets that's being driven by the weakened economy.

"It's another validation that there's a softening in the [storage] market," Prigmore said.

But EMC's lower-than-expected results and the company's need to cut costs don't mean that users are shifting away from its top-dollar storage devices in favor of ones from rival vendors, Prigmore added.

"The one thing about EMC is you don't have to worry about them returning to profitability," he said. "They're [still] outrageously profitable."

Hitachi Partners With NSS To Enter New Storage Space

Move will enable SAN, NAS functions

By ASHLEE VANCE

Hitachi Data Systems Corp. entered the network-attached storage (NAS) market last week, when it began distributing three products manufactured by Chanhill, Va.-based Network Storage Solutions Inc. (NSS).

HDS will distribute the NSS-branded SpanStar-GT, NAS-engine and pStar-II appliances worldwide, effective immediately.

The move will allow Hitachi to compete on a broader front with Hopkinton, Mass.-based storage systems manufacturer EMC Corp. The companies are already going head-to-head in the high-end storage market.

Extending its product range will allow Santa Clara, Calif.-based HDS to address demands from customers for

multipurpose storage systems, analysts said.

"I see this as a move in response to customer demand for a product that does both SAN and NAS functions," said John Webster, an analyst at Illuminata Inc. in Nashua, N.H. "I think a significant proportion of the high-end customer base is looking for arrays that can play in both environments."

For example, customers could attach the new NAS appliances to large storage boxes, such as Hitachi's Freedom Storage Lightning 9960

Thunder 9300 systems. They could then allocate part of the bigger unit's capacity for use by NAS applications while other parts of the array are used by the storage-area network (SAN), according to Kelly Tanaka, director of NAS technology at HDS.

One Hitachi customer currently using a Lightning 9960 with NSS products said that

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the pairing works well for data transfer speed but warned that software from NSS lacks some of the functionality he wants.

"The good part is that it's an easy combination to set up and does not take up too much space," said Albert Baraija, vice president of engineering at Space-Trent, a managed services and hosting company in Carlsbad, Calif. "It is pretty fast as well, but they are behind on software features."

The NAS appliances use NSS's SpanStar operating system, which the small company prides itself on. But some customers say they want more from the software. Baraija, for example, said he would like to have better fail-over, backup and functionality choice.

HDS acknowledged that NSS is lacking some of the rich software features EMC is often praised for and has set some guidelines for its smaller partner to follow.

"That is one of the downsides of going with a smaller company," Tanaka said. "They have been focusing on performance more than feature and function. They are going to add it."

Vance writes for the IDG News Service in San Francisco.

BRIEFS

Lucent, Alcatel Call Off Merger Talks

Lucent Technologies Inc. and telecommunications equipment rival Alcatel SA last week ended merger talks after being unable to successfully negotiate a deal. The talks with Paris-based Alcatel had been seen as a potential savings grace for Murray Hill, N.J.-based Lucent, which has been wracked by losses, declining sales, management changes and layoffs since last fall. But in a statement posted on Lucent's Web site on May 29, the two companies said the negotiations "have not resulted in any agreements and have been terminated." The networking vendors didn't comment on the reasons why a deal couldn't be reached.

Acer Licenses Palm OS for PDAs

Taiwan-based PC and electronics device maker Acer Inc. last week announced that it has licensed San Jose, Calif.-based Palm Inc.'s Palm OS for use in personal digital assistants (PDAs). The deal will make Acer the first Taiwanese company to license the operating system, which runs Palm devices, as well as Handspring Inc.'s Visor and Sony Corp.'s Clie PDA. Sony, Japan's Kyocera Corp. and South Korea's Samsung Electronics Co. are the other Asian companies that have licensed Palm OS.

Short Takes

Boston Bartons, former CEO of troubled Belgian software vendor LERNOUT & HAUSPIEL SPEECH PRODUCTS NV, was arrested in a Boston suburb on allegations of financial fraud, stock price manipulation and other charges on a Belgian warrant. . . . Dulles, Va.-based AMERICA ONLINE INC. appointed Louis A. Bernilli Jr. as senior vice president of AOL Broadband. . . . IBM has joined with FUJITSU LTD., HITACHI LTD. and NEC CORP. to expand the development of the Linux operating system for wider business use in Asia.

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PATRICIA KEEFE

A Ray of Light

IT'S BEEN A LONG, COLD SPRING in the unemployment line, and summer isn't shaping up to be much better. Consider that instead of decreasing as expected, May jobless claims rose by 8,000, to 419,000. The dot-com dead continue to pile up, jumping by 82%

last week alone to break the 100,000 mark, according to The Industry Standard. Meanwhile, Old Economy companies are laying off 10% here, 3,000 there. Lower IT budgets are forcing many managers to do more with less. IT hiring is at a standstill, and CEOs are suddenly sticking close to home.

"Everyone wants a job and is nervous about keeping it," says Computerworld columnist and career specialist Fran Quittel. She typically receives about eight pages of career-related e-mails a week. This past week, she received 72 pages.

Amid this gloom, a small ray of light popped up earlier this month in an otherwise brutal announcement from Cisco Systems, which plans to cut 8,500 workers.

In an innovative and humane experiment in downsizing, Cisco, long known for its leading-edge approach to hiring and recruiting, will give employees who agree to work for a year at nonprofit agencies one-third of their salaries and full benefits. They may also get their jobs back in a



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year. Sure, this program undoubtedly benefits Cisco on a legal, financial and image basis. And salvaging a measly 2,000 jobs out of 8,500 seems a puny gesture. But that doesn't diminish the win-win situation for the employees themselves, the nonprofit groups that could use access to experienced professionals and the community, whose unemployed burden and related fallout is a tiny bit lighter.

For managers who just six months ago were struggling to find skilled workers, Cisco's experiment should

hold enormous appeal. Coupled with other measures, such as canceling bonuses and management perks, it could help limit the damage when cutbacks are necessary. It's also one way to hold on to valued employees. This kind of creativity shows in real terms how to think beyond the balance sheet and how a company's actions can affect stakeholders in the company, not just the stockholders. And without a dedicated, loyal workforce, there can be no light at the end of this economic tunnel. ▶



PIMM FOX

Online Privacy Should Be a Right, Not an Option

ONLINE PRIVACY POLICIES are confusing and often contradictory. And to a large extent, they place the burden of privacy protection on users, not on the firms that collect, sell or share data.

For example, while most Web sites require — or track in the form of cookies — different forms of individual identification, they do this using a generic "opt-out" policy in which users have to hunt for Web pages that allow them to selectively withhold personal data.

Time Warner, one of the world's largest operators of news and entertainment Web sites, has a privacy policy stating that the company has the right to sell personal information that it collects about customers and Web site visitors, except for those who opt out.

One of Time Warner's users could click on an ad for the movie *Pearl Harbor*, zero in on the Entertainment Channel, and buy tickets through the company's MovieLine service.

Months later, the same user could be targeted with a promotion to purchase the video.

This is all legal. The customer didn't know he had to actively prevent personal information from being released.

Indeed, America Online — Time Warner's new owner — has a privacy policy promising not to use information for marketing purposes about where individual members go online, but the company has started to increase the amount of advertising geared to where members live. AOL now sells Time Warner cable TV service to AOL members who live in Time Warner cable territories.

AOL also gives advertisers the chance to send ads to members who live in certain areas or to specific user demographic groups.

Mike Schreock, an analyst at PricewaterhouseCoopers, says there's a trade-off as the move to permission-based marketing gains support.



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"Companies view the information they have on you as a strategic asset, but you might not want them to have it," he says.

An example of a workable opt-in, rather than opt-out, online privacy policy could be based on the Children's Online Privacy Protection Act (COPPA) and rules enacted under COPPA.

To protect children's privacy and safety online, COPPA regulates when and how companies must seek verifiable parental consent before using data about children. COPPA rules are concerned with information that could make a child identifiable online. That includes his name, e-mail address, telephone number and attributes such as hobbies.

Internal use of data can be granted via e-mail, whereas distribution of information to third parties requires a signature or fax.

Why shouldn't adults be afforded the same legal protections? And why can't technology be used to uphold individual privacy, rather than render it obsolete?

ANDREW WILSON

H-1Bs Are Still Needed, Despite Slower Economy

IT'S BEEN EIGHT MONTHS since Congress raised the cap on H-1B visas from 115,000 to 195,000 annually through 2003.

Ironically, as if on cue, economic growth has slowed, and many companies have been

forced to downsize. Does this mean that IT managers should file their H-1B recruiting handbooks underneath their Y2K compliance manuals? Simply put: No.

While staffing your IT department may not be as high a priority as it was a year ago, there's still a hoot for highly skilled computer professionals.

In fact, during this period of budgetary restraint and slash-and-burn tactics, a quality IT worker can help increase business efficiency and reduce operating costs.

If you agree that the economy will recover and that a shortage of technological skills is a serious threat to a company's survival, here are two reasons IT managers should continue the H-1B hunt:

■ Lack of domestic workers with crucial IT skills.

There's still a tremendous shortage of highly skilled IT professionals in the U.S. The number of

computer professionals coming out of colleges in both India and China dwarfs the number graduated by U.S. schools. In fact, according to the National Science Foundation, the number of U.S. engineering graduates has slipped more than 7% in the past decade.

Also, training programs funded by increased H-1B fees aren't producing individuals with the necessary technological talent. These programs were implemented to raise the skills of U.S. workers so they could fill the high-skill jobs now held by H-1Bs. Unfortunately, the programs are focused primarily on teaching basic computer skills to entry-level workers. While these programs are helping many Americans improve their lives, they're failing to address the shortage of U.S. workers who have the skills companies need.

H-1B portability



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JOHN GANTZ E-Marketplaces Are Down, but Not for Long

WHAT I LIKE about the dot-com stock crash is the misconception it has brewed. For instance, there's the notion that business-to-consumer e-commerce is dead (there will actually be tenfold growth in four years) or that brick-and-mortar companies will no longer invest in e-business (they'll actually spend 25% more on e-business technology this year).

Take electronic marketplaces, those once highly touted Internet sites where companies in an industry can buy or sell their goods and services to one another. The bursting of the dot-com bubble has people thinking this concept will go away, too.

Not so. IDC's big "eWorld 2001" survey conducted in 27 countries earlier this year found that businesses around the world are — surprisingly — interested in e-marketplaces. In fact, in Europe and the U.S., about 75% of IT managers and CIOs are familiar with the concept (Japan lags with only 45% awareness), and about one-third expect to participate in an e-marketplace this year either as a buyer or seller. Small companies tend to want to buy over the exchanges, while large companies tend to want to sell.

There's a reason why IDC believes that these exchanges will host half the Internet business-to-business commerce by mid-decade, despite the dot-com crash and the industry consolidation that's under way. Right now, there are two main methods of business-to-business Internet commerce. The first is procurement-centric, by which companies buy over the Net by linking their ordering systems to multiple catalogs or suppliers' Web sites. The second is sales-centric, by which a seller links to customers through an extranet. Both are point-to-point.

But because most companies are both buyers and sellers of goods, it makes sense for them to migrate to a multipoint-to-multipoint setup — like these e-marketplaces. If I'm right, most companies will be ill-prepared for the transition. Here's what you need to do and what you ought to factor into your IT planning:

- Prepare your internal systems to speak to the outside world — something you need to do

regardless of which B2B commerce method you employ. If you're going to share information on your products, such as stock numbers, descriptions or prices, you'll need them to be rationalized and collected into a database, unless you're an airline, where each seat on a plane is sold at a different (and mysterious) price.

- Understand the technical requirements of collaborating over exchanges. Support for multiple document exchange formats, such as XML, cXML, RosettaNet and BizTalk, will be required, at least for big companies.
- Get really organized about security. I know you're picking up the pace here anyway, but you'll need extra care when dealing with multiple unknown buyers and sellers.
- Expect the unexpected. Resistance to change can come from any quarter, from salespeople who don't want trades over exchanges to eat away at their commissions to marketing managers who don't want competitors to see product data to managers who don't want to settle on a standard on which they haven't already standardized.

The tide will start to move toward e-marketplaces by the end of this year. Expect to be carried along with it. ▶

BILL LABERIS

Need Money for Security? Here Are a Few Tips

THE COLLAPSE of the dot-coms and the slowing of the U.S. economy have renewed interest in justification of IT spending. A year ago, money flowed freely for most projects under the e-business mantle. But today, approval is most swiftly granted only to those projects with the most demonstrable return on investment.

While the CFO may prefer this, IT managers responsible for data and computer security face a conundrum. It's exceedingly difficult to perform any kind of ROI analysis on security projects. That's because the ROI on most of them is tied up in what the organization won't pay as a result of having implemented strong, consistent security measures. Even then, some of what is saved is intangible, like customer confidence and goodwill. It's important, but still intangible.



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It's no surprise that as enterprise systems become increasingly network-centric and as more knowledge employees work away from the cozy, safe confines of a central office, security threats ominously mount. Remember the annoying "I Love You" virus of last year, which spread over e-mail networks? Computer Economics Inc. in Carlsbad, Calif., pegged the cost to business of dealing with the resulting mess at nearly \$7 billion in the first week after it hit.

There's also a peculiar aspect of security provisioning that further complicates life for IT managers. It's very difficult for anyone to know, let alone prove to senior management, how much security is enough. No system can be rendered totally secure. So how secure do you want or need to be and at what cost?

Securing networks, remote and mobile workers and budding e-business operations is very expensive in terms of equipment and staff, and security applications are often highly complex. And these expenditures don't directly add to the bottom line.

Also, many IT managers are concerned about sounding too much like alarmists when it comes to data security, especially to senior executives looking to shoot down projects with thin ROI justifications. You have to speak their language about security, putting matters in terms to which they'll readily relate. Here are some suggestions:

- **Put the fear of lawyers in them.** Computerworld reported on May 21 [Page One] that it's a matter of mere months before some victims of cyber-tacks file big, honking negligence lawsuits against companies that weren't aggressive about securing sensitive data. While no one can yet say what the proper or legal level of protection might be, that won't make a difference to litigators should the right opportunity present itself after an attack.
- **Give them the cold, hard facts they love.** Gathering data and statistics on the costs of cybersecurity and hacker attacks has become a subindustry, and you should share this data with your bosses. The Computer Security Institute teams up with the FBI annually to produce a highly regarded computer crime survey, complete with cost figures. Last month, the University of California at San Diego released a study showing that some 4,000 denial-of-service attacks occur weekly. In a supreme irony, hackers last month successfully whacked the Web site belonging to the CERT Coordination Center at Carnegie Mellon University in Pittsburgh, which is responsible for tracking hacker attacks.
- **Plug them in.** Forward-thinking companies regularly review security policies and procedures and update them accordingly. The really progressive firms directly involve senior executives in review meetings, aligning policies with strategic business issues from the start.

These are small, doable steps to getting the support you need for the security you want. ▶



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“The vision was to
... create a single
process and
supporting system
for purchasing
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This year's Computerworld Honors finalists, finding innovative ways to make techn

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Procurement Network Harnesses Buying Power

Boeing maximizes volume discounts with Web-based system that links employee purchases worldwide

BY JAKUMAR VIJAYAN

HOW HARD CAN IT BE to manage the purchase of office supplies and professional services? Very hard. Just ask The Boeing Co.

As the world's largest airplane manufacturer, Seattle-based Boeing generates millions of purchase orders and spends about \$3.5 billion annually on nonproduction goods and services such as office and shop supplies, professional services, machine tools, vehicles, computers and software.

The huge task is managed by Boeing's Shared Services Group, which was set up to handle, among other things, all nonproduction purchases after the company's acquisitions of Milwaukee-based Rockwell International Corp. and St. Louis-based McDonnell Douglas Corp. When the new organization first took over the task, it found it had to deal with 17 purchase systems across the three companies, all based on technologies from the 1960s and '70s. As a result, much of the purchase information needed to aggregate orders and negotiate volume discounts had to be collected manually and wasn't always accurate. Employees often circumvented Boeing's system and paid full retail price, even if the vendor had already negotiated a volume discount on that item with suppliers.

In 1999, the group launched an enterprise-wide Web-based system for ordering, acquiring and paying for nonproduction items, says Candace Ismael, direc-

tor of Boeing's supplier management and procurement functions. The system is the first company-wide, noncustomized software deployed at Boeing; it lets users worldwide access it in the same manner. "The vision was to take all of those multiple, back-end purchasing systems and to create a single process and supporting system for purchasing indirect parts," says Ismael.

The Shared Service Procurement/Payables Network (SSPN, or Spin in Boeing speak) is still being rolled out, but it already lets thousands of Boeing employees worldwide purchase and pay for office supplies from a Web page. To buy an item, a Boeing user connects to the SSPN Web page, searches an online catalog of preapproved items for which prices have already been negotiated, adds it to a shopping cart and submits the order. User profiles determine the employee's buying authority, and orders are routed to managers for approval when necessary.

Suppliers electronically bill Boeing and are paid via electronic funds transfer directly to their banks.

The system is built around Oracle Corp.'s Internet Procurement software and allows for better volume discounts, supplier management and much greater efficiencies in purchasing, Ismael says.

Ismael says a big challenge has been managing changes brought on by the new system. Supplier management and procurement departments that used to handle purchase functions feel "somewhat threatened" by the new system, she says.

"There is a lot of resistance to change in an organization this large," Ismael says. Consequently, one of her roles has been that of change management agent, getting support needed across Boeing to pull it off. ▶

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2001 Finalist

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Business & Related Services

■ **Ash Jaeger Inc.**: A natural language interface makes customer inquiries more natural and effective, encouraging customers to use this lower-cost, more immediate way to learn what they need to know.

■ **Autoweb.com**: A comprehensive one-stop Web shopping site allows customers to compare and configure cars and finance options, guiding them to the right vehicle at the right price.

■ **Lands' End Inc.**: Real-time human assistance via online text-based chat or immediate call-back allows shoppers to co-browse with trained personal shoppers.

■ **Monster.com**: The leading global online careers network connects job seekers with qualified candidates, helping to bring interesting, valuable jobs and valuable employees together.

■ **Sendmail Inc.**: The de facto implementation standard for e-mail on the Internet continues to power more than 60% of all domains. 20 years after its invention stimulated the dramatic growth of e-mail itself.

■ **Wal-Mart Stores Inc.**: Retailer uses collaborative vendor forecasting and planning to smooth the flow of goods from 4,000 vendors through 51 distribution centers to 2,500 stores, reducing distribution costs by 30% compared with competitive organizations.

Education & Academia

■ **The Bridge School**: Individuals with severe speech and physical disabilities receive intensive training in the use of assistive technologies that allow them to return to their home school districts as full participants.

■ **J.P. Morgan Chase & Co.**: Provides a computer in the homes of every student in a middle school where 92% live at the poverty level; leverages the resources of a corporate partner to engage the community, strengthen school performance and help students.

■ **Microsoft Corp.**: A free, online professional development community offers educators instructional resources, lesson plans and online summers, helping them improve student learning and stay up to date.

■ **Newark Unified School District**: Hundreds of thin-client student stations, supported by powerful servers, expand the use of desktop and network-based mapped school system to times in the employment marketplace.

■ **Technology Access Foundation**: A four-year technical education program, culminating in a demanding summer internship, helps underserved minority teens find the means and incentive to pursue higher education.

Environment, Energy & Agriculture

■ **Hydro One Inc.**: Intense real-time computer gaming drives cultural change into a formerly bureaucratic government-owned electrical utility, preparing its managers to act on commercial principles for the first time (see page 25).

■ **The Office of Marine Programs**: Students and citizens around the world can make virtual visits to the diverse, ecologically important coastlines of Rhode Island. In this way, they can experience an environment that they

broke new ground in varied
ology matter in the real world.

Matter

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aren't able to visit directly on a regular basis.

The Ward-Meetville Heritage Organization: Two-way videoconferencing and wireless technologies enable students to "visit" and study a delicate saltwater marsh while reducing harmful foot traffic in the ecosystem.

■ VNG-Verbandshaus Gas AG: Precise monitoring of conditions throughout a 5,000-mile gas pipeline network in real time assures a consistent product flow to customers via a growing number of gas stations and distribution points.

■ Walker County Schools (Georgia): Promoting social responsibility through Internet-based environmental science is the goal of this Web-based environmental science teaching module, which enables students and teachers around the world to participate in environmental studies, collaboratively conduct research and implement action plans to address local and global environmental problems.

Finance, Insurance & Real Estate

■ Charles Schwab & Co.: A single point of reference supplies the wide array of knowledge that employees need to do their jobs and manage their careers, enhancing productivity and employee satisfaction (see story at right).

■ Ostfield Estates (Oregon): Homeowners were assisted living units gather the information needed to ensure the safety of residents and limit corporate liability while allowing residents to maintain autonomy, choice and personal control over their daily lives.

■ PayPerPhone.com Inc.: Online car loan applicants receive approved loan funds within minutes, allowing them to buy a car either from a dealer or by private sale, making it easier and less expensive to choose the right car.

■ Prudential Financial: A single aggregated data source provides complete information about life at a new location to potential transferees and members of their families, increasing the success of employees who decide to move to take a job.

■ Wells Fargo Internet Services Group: The first online person-to-person business service offered by a financial institution provides secure payment options to the eBay Inc. trading community, giving buyers a choice of payment methods while assuring sellers of reliable funds.

Government & Nonprofit

■ Highmark Inc.: Health care providers and medical office staff handle insurance claims, clinical submission, access controls and benefits calculations in real time via the Web, reducing costs and improving care.

■ New Jersey Department of Health and Senior Services: Online creation of death certificates within 24 hours reduces administration costs and ensures that government benefits go to the proper recipients.

■ Second Harvest: Businesses with excess goods or transport capacity are matched online with charities that can get those goods to needy people, expediting the process for items with short shelf lives like food.

■ The Daughters Sisters Project: Web sites, e-mail lists, digital cameras and scanners become integral tools in a program's efforts to turn lives around and successfully re-create them in ten years.

■ U.S. Food and Drug Administration: Rapid capture and analysis of 175,000 annual reports of adverse drug

reaction process is on such a huge scale that until recently, scientists couldn't assemble computers powerful enough to crunch the immense amount of data necessary to realistically simulate the movement of the plates.

Like a giant radiator, the Earth rids itself of the intense heat within its core through a massive circulation system of molten earth and solidified crust, powering the movement of the continental plates, sculpting mountains and other surface features. Earlier scientists built such computer models but viewed the processes in two dimensions — depth and horizontal extension — which isn't a true 3-D representation of the Earth. But that previous work showed in principle that with relevant equations, the motion of the plates and the inner-Earth convection processes that fuel them could one day be simulated.

Bunge's team, which also included Mark Richards, his doctoral adviser at the University of California at Berkeley, determined that what was needed was a 3-D model. Using convection simulation software called Terra, developed earlier by John Baumgardner, a research scientist at Los Alamos National Laboratory in New Mexico, Bunge adapted the simulator to work on a Cray T3D parallel-processing supercomputer with 256 Alpha-based processors. Each processor in a parallel computer has its own memory and operating system, providing greater resources to work out complicated computations. With 4GFLOPs of computing power, the Cray provided clues that inspired even more research.

"Those steps that we did really led to a more realistic interpretation of the Earth's interior," Bunge says. "With the right software and the right computers, you can ask very complicated questions."

More detailed simulations will require a new generation of even more powerful computers, but measurable progress is being made. "These computer simulations are bringing us closer to the 'why,'" Bunge says. Given another 10 years or so, he predicts, scientists hope to have the answers they seek.

"The answer is like a beacon," he explains. "You see it in the distance, but along the way, you go through uncharted territory." ■



PRINCETON'S Hans-Peter Bunge: With the right computers, "you can ask very complicated questions."

PRINCETON UNIVERSITY

Supercomputer Taps the Mysteries Of the Earth's Crust

Research could enable accurate prediction of earthquakes and volcanic eruptions

BY TODD R. WEISS

IT'S A TANTALIZING PUZZLE, teasing geophysicists by keeping its secrets locked away deep within the Earth's continuously evolving crust.

For decades, scientists have known that the Earth's continental plates are constantly moving at a glacial pace over the planet's surface, changing its appearance since it was first created some 4.5 billion years ago. But the complicated internal fluid dynamics that cause this movement are still a mystery.

Using a massively parallel supercomputer and specially designed modeling software, researchers at Princeton University in New Jersey have been slowly digging toward the answer. They've been working to understand the cycle of convection occurring deep inside the planet, where heat and pressure combine to warm thick layers of earth, turning it into ooze, while new layers solidify simultaneously and rise to the surface. The researchers' work has brought about progress that could someday help scientists accurately predict earthquakes and volcanic eruptions.

"Why [the plates] are moving in this particular way ... are things that we speculate about," says Hans-Peter Bunge, an assistant professor at Princeton's geosciences department and leader of the research project. "We don't understand quantitatively why the plates move," he says. The problem is that the con-

CHARLES SCHWAB & CO.

Intranet Helps Workers Navigate Corporate Maze

Self-service resource provides 30 applications for everything from training to a directory of benefits and time sheets

BY THOMAS HOPPMAN

IT RECEIVES 1.3 MILLION PAGE VIEWS PER DAY, BUT IT'S not Yahoo or America Online or even CNN.com. It's an intranet created by Charles Schwab & Co. that enables Schwab's 23,000 employees to access detailed information about benefits, training, computer support and scads of company information.

The genesis of the intranet was in 1996, with the

COMPUTERWORLD HONORS

molski, an analyst at Gartner Inc. in Fallbrook, Calif. "From a productivity standpoint, people can save a lot of time about who to go to, who does what, etc. — especially these days, as organizations want people who can hit the ground running."

There are now 30 applications that link into the Schwab, including the Learning Intranet, an application that helps manage training for Schwab's 14,000 customer-facing employees, and eTimesheets, which employees use to manage their own vacation time.

The productivity benefits alone from the use of the Schwab are huge. Charles Schwab is saving hundreds of thousands of dollars annually by having employees fill out benefits forms online using an application called eForms, says Barr.

Barr says she's hopeful that the intranet can evolve to generate richer, more targeted information to Schwab's employees. The idea, she says, is to "help us maintain our entrepreneurial spirit as a company and maintain our values going forward." ▀

HYDRO ONE INC.

Game Stimulates New Thinking in Utility World

Market competition forces managers to learn to create shareholder value

BY MATT HAMBLETON

IMAGINE YOU'RE A HIGH-LEVEL MANAGER at an electric utility, facing multiple crises in a single day.

First, a major ice storm shuts down much of your energy distribution. Minutes later, a regulatory authority states that your company must surrender 30% of the previous quarter's profits. The regulator's action forces you to quickly appear before investment bankers to get them to open their wallets. And on top of that, you must make decisions with two managers whom you don't know well.

Such is a typical day in the Strategic Growth Game, a computer-based training tool being used at Hydro One Inc. in Toronto. Designed to help managers learn how to cope and strategize in a newly competitive energy field, the game has already been played in the past year by almost 500 managers at the 5,000-worker company, says Gerry O'Hearn, senior vice president of corporate affairs and an executive sponsor of the project.

"Unlike their day jobs, managers don't get a lot of time to make decisions in this game," says O'Hearn. "There's a lot of information and... we're intentionally trying to make it fairly intense."

The goal of the game is to help managers streamline the decision-making process, he says. That's because Hydro One is entering a world of market competition where shareholder value is the brass ring. Before 1998, the utility firm was part of a larger company that was government-owned, but then the gov-

ernment sold its stake to private investors. ▀



**HYDRO ONE'S
Gerry O'Hearn**

COMPUTERWORLD HONORS

Continued from page 34

reactions allows a government agency to quickly assess potential threats and ensure ongoing drug safety.

■ **U.S. Postal Service:** Sophisticated analysis systems sniff out 600,000 money orders that are likely to involve money laundering from a \$26 billion annual flow of money order transactions, aiding proactive law enforcement.

Manufacturing

■ **Dell Computer Corp.:** A build-to-order computer company automatically converts sales orders to material requirements, transmits them to suppliers and receives delivery confirmation, monitoring supply chain coherence in a system where factory schedules are refreshed every two hours.

■ **Delphi Automotive Systems:** Linking-edge information technologies automate a plastic injection molding facility, enabling leaner and more agile operation and worldwide access in real time.

■ **ITT DeCofe Inc.:** The Modis mobile phone service allows customers to access the Internet through a mobile phone device, enabling continuous access to e-mail, business transactions, news and information, and database and direct marketing.

■ **The Home Depot:** An integrated system for ordering, managing and paying off \$3.5 billion of in-store purchases each year slashes acquisition time, saves money and empowers employees (see PC 33).

■ **Tigit Computer:** A complete PC roughly the size of a book of matches allows the huge body of existing desktop software to be run on a device that fits in a pocket or briefcase.

Media, Arts & Entertainment

■ **Outenberg 21st Century Association - 125 Ce.:** Ultrasecure scanning techniques allow priceless documents such as the Gutenberg Bible to be scanned at high speed under low light, preserving these treasures in easily disseminated digital form.

■ **OnlineConservatory.com:** Music students who would otherwise have to travel long distances to lessons now interact with their teachers online using MIDI-compliant keyboards and microphones, dramatically widening access to music education.

■ **OnStageArt.com:** An innovative digital arts faculty and program in which disabled-children ages 9 to 21 learn hands-on skills in digital imaging, multimedia and Web production.

■ **Teatre alla Scala (La Scala Theatre):** Digital Asset Management speeds access to two centuries of unique historical artifacts and increases the global impact of one of the world's most famous cultural institutions.

■ **The Jim Henson Co., Division of the Creature Shop:** Puppets control 3-D computer-generated characters that form in real time, even conversing live with people, reducing costs while fully preserving the spontaneity of a traditional puppet performance.

Medicine

■ **Chicago Alert System:** Installation of public-access defibrillators, made by the Zoll Corporation, throughout Chicago supports saves lives and proves that bystanders with no medical training can use the right equipment, save those lives.

■ **eClinicalHealth Inc.:** Digitization of more than 30 million of the medical records currently stored in its rooms of health care providers helps ensure that this information

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COMPUTERWORLD HONORS

2001 Finalists

*Continued from page 35***■ Medtronic Inc.:** Implantable cardiac devices communicate with physicians over the Internet, providing critical information that results in better patient care and greater patient mind.**■ Middlewire Inc.:** Innovative algorithms move large files across the Internet much faster than e-mail or the transfer protocol, making possible the routine sharing of very large files like high-resolution medical images (one story at right).**■ University of Western Ontario Computer-enhanced robotic surgery:** It's possible to perform cardiac bypass via pencil-size incisions, lessening pain and reducing months of recovery time to days.

Science

■ Berkley Orthopaedic Biomechanics Lab: Supercomputer simulation of the microstructure of bones helps doctors understand and treat degenerative bone diseases, improving quality of life, particularly for seniors.**■ Broadcom Corp.:** A single, highly sophisticated signal processing chip dramatically increases the capacity of cable TV cables, making true broadband economically viable.**■ CERN:** A dynamically reconfigurable computing system architecture allows a world-renowned physics community to adapt its approach to solving problems posed by the constantly changing needs of its experimenters.**■ Jet Propulsion Laboratory:** A commercial aerospace design environment. Using one set of 3-D description files, it shrinks the time required for a vehicle's early design phases by factors of four and more while improving design quality.**■ Princeton University:** A massively parallel computer simulation that uses a cluster of 140 processors to simulate the ebb and flow of the Earth's mantle as it sculpts mountains and digs out ocean floors (see story page 34).**■ University of Kentucky:** Dramatic new network architecture created by genetic algorithms allows linked PCs to work together as one of the world's most powerful and cost effective supercomputers.

Transportation

■ Delta Air Lines Inc.: Making high-quality home computers available to every employee of a major airline costs nothing, says the company, which has given away thousands, and their families, to those in the Digital Age.**■ Ford Motor Co.:** Offering home computers to company employees creates a new and more empowered culture and provides inspiration similar to the company's breakthrough 55-per-day wage plan in the early 20th century.**■ Heavy Vehicle Electronic License Plate Inc.:** High-speed weigh-in-motion sensors embedded in state highways combine with in-truck transponders to identify and weigh trucks in motion, maintaining compliance while keeping trucks moving.**■ Maritime and Port Authority of Singapore:** A computer system tracks the movement of shipping containers and orders them to be moved in the world's busiest port, where a ship arrives or departs every two minutes.**■ Oditel:** Drivers access personalized Web-based information, including e-mail, stock quotes, news, weather and traffic, using a hands-free, voice-activated interface to control output through the vehicle's sound system.*Continued from page 35*
ernment of Ontario stepped in to introduce market changes that will take full effect next year.

Three teams of three people each compete against one another in 10 sessions of 25 minutes. At day's end, the team with the greatest shareholder value wins. Because the game includes ice storms, wild mergers and regulators who throw curve balls to managers, "we've seen senior people blow up because the numbers weren't acting properly," says Les McKay, chief implementation officer at subsidiary Hydro One Telecom Inc.

If the game has been intense for managers, several managers say it's worth the time they spend away from their real work, not to mention the cost of the game software, which was provided by consultants at PricewaterhouseCoopers. "People have learned a great deal in subtle ways," says Cedric Stevenson, manager of leadership development. "We're attempting to change our culture and make managers understand the concepts of creating shareholder value."

Business schools widely use such games, but the use of a customized format like this within a utility is rare, analysts say. A Web-based game called Fantasy Utility is popular in England, but it isn't customized for any particular company, says Rick Nicholson, an analyst at Meta Group Inc. in Stamford, Conn.

Michael Kay, a consultant at New York-based PricewaterhouseCoopers, tailored the game for Hydro One over a period of six weeks. He says a company could get customized game software for between \$100,000 and \$500,000. "This whole area of business gaming is booming, even though it was considered trivial before," Kay says. "People are beginning to realize there are certain things you can't do any other way." ▶

MIDDLEWIRE INC.

Technology
Advances Exchange
of Medical Images*Physicians can easily and securely transmit life-critical diagnostic files to speed treatment of patients***BY JOSEPH A. KEEFE**

IF YOU'VE EVER HAD AN E-MAIL MESSAGE bounce back because it contained data too large to transmit, imagine the frustration if you were sending life-critical images like MRIs or CT scans.

Middlewire Inc., a multimedia messaging company in Los Altos, Calif., is focused on breaking the "large-file barrier" stipulated by many application programs and e-mail systems. The company's patented file-transfer technology makes the process of sending very large files more secure, and easier for the sender, by using a Web browser.

Middlewire is proving its mettle by assisting physicians in the lightning-fast transmission of life-critical diagnostic image files, and on another front, by providing the vehicle for timely and secure handling and storage of voluminous financial services data. And it

**MIDDLEWIRE'S** David Knight: "Ultimately, we intend to improve any and all aspects of Internet applications."

does so at a cost that rivals and, in most cases, is much less than that charged by courier services. In a real-life example, the Middlewire system transported more than 2.6TB of data in a 24-hour period.

The technology is the vision of Middlewire founder and project leader David Knight and is based on separating the information to be transmitted from the addressing used to deliver the information (like the way phone networks break out the number dialed, routing and management of call quality and billing data). By separating information from its addressing, users can reuse audio, video and imaging files using a wireless device. On the receiving end, using a tunneling method and HTTP addresses, the recipient views the file in a standard browser or downloads "autosizable" files. Existing file-transfer methods are bypassed completely.

Knight compares his product's potential impact to that of shipping containers for seaborne cargo. Just as those containers allow for fast, safe and seamless transfer of large quantities of individual cargoes, Middlewire's application enhances the exchange and storage of critical information. Think your e-mail and critical business attachments are private? Think again. On the waterfront, the locked container eliminated about 80% of cargo damage and theft almost overnight. Middlewire improves security in a similar way with password-protected transmissions and confirmation of receipt when the file is opened.

"Middlewire is merely picking the low fruit off the tree," says Knight. "Ultimately, we intend to improve any and all aspects of Internet applications as the technologies allow and the need arises." The company's next move is "overall upgrading of conventional e-mail, security and accounting of e-mail, and other Internet-based activities for business," he says.

"We're building technology that will ultimately bring the same applications, concepts and powers to the desktop user instead of having to rely on the big Web site operators and service providers," he says. ▶

Keefe is a freelance writer in Charlotte, N.C.



How business becomes e-business

The great e-business shakeout is well under way. For those who didn't make it, our condolences. At least the end was quick.

For those who have made it, who broke the code and figured out how to build a truly viable e-business, our heartiest congratulations.

As it turns out, many of these successful companies—including the majority of the Fortune e-50—have built their e-businesses on an exceptionally strong foundation.

The BEA WebLogic® E-Business Platform™

This award-winning set of innovative software and services is uniquely designed to help businesses rapidly develop and launch advanced e-commerce initiatives. It's an end-to-end solution that includes rich personalization and complete B2B integration.

In fact, it's now the global standard by which all e-commerce software is measured.

Which explains why it's BEA's market-leading platform that powers Chase Manhattan, FedEx, Amazon.com, United Airlines, Wells Fargo, E*TRADE and over 10,000 other successful e-businesses. Find out how we can help yours. Visit us at www.bea.com.



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**OUR
ONLINE
SHOPPERS
DON'T JUST
“ADD TO
SHOPPING
CART.”**

**THEY
“ADD TO
FREIGHT
CAR.”**

When an online book order doesn't show up on time, it's not the end of the world. But when you manufacture VLSI chips, and your supply chain grinds to a halt because 20,000 gallons of ammonia are missing in action, you've lost more than time. You've lost customers. SAP's Supply Chain Management solution—part of the mySAP-eBusiness platform—lets you collaborate with customers, partners and suppliers to keep your supply chain moving. Whether your customers order by the pound or by the ton. Learn more: type in www.sap.com

THE BEST-RUN E-BUSINESSES RUN SAP



BUSINESS

DOLLAR SENSE

The bubble of optimism may have popped on Wall Street, but it's as inflated as ever among IT analysts, writes Paul A. Strassmann. But are predictions that IT spending will amount to 10% of total revenue by 2005 realistic? Not when you do the math. And the budget crunchers always do the math rather than rely on airy predictions to justify spending. ■ 46

THINK LIKE A CUSTOMER

Designing Web e-commerce relationships is more intricate than just building systems. The feeling of speed can be more important than actual speed, and being able to predict customer behavior can save a site, according to researchers featured in this month's *Harvard Business Review*. ■ 50

Faint Hope

In a tight economy, many firms hang their hopes on the promise that customer relationship management systems can increase revenue and retain customers. But successful CRM rollouts mean lots of plodding before you can get where you're going — if you can get there at all, warns Kevin Fogarty. ■ 56



Despite a cooling economy, the top IT employers remain committed to investing heavily in their staffs. This includes generous benefits packages, access to lots of training, challenging projects and opportunities to advance.

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MORE

Advice 55
Workstyle 48

100 BEST PLACES TO WORK IN IT

In This Series

JUNE 1 ISSUE:

Overview: What it means to be a Best Place to Work in IT, and what you should be doing for your IT staff if you want to be a top employer.

Survey ranking: Full ranking of the top 100 employers and information on the offerings that helped them make the list.

JUNE 11 ISSUE:

Retention: Joanne Weider asks how top employers determine which practices impress employees. Plus: The 10 Best Places for Retention.

Career development: Sharon Watson profiles how top employers help employees plan and advance in their careers. Plus: The 10 Best Places for Career Development.

JUNE 18 ISSUE:

Benefits: Monica Solomon reviews the benefits packages offered by the best IT employers. Plus: The 10 Best Places for Benefits.

Diversity: Kathleen Molyneaux finds that at the best IT employers, successful diversity begins with a nurturing corporate culture. Plus: The 10 Best Places for Diversity.

JUNE 25 ISSUE:

Training: Leslie Jaye Goff writes about the training investments top employers make to attract and retain top IT professionals. Plus: The 10 Best Places for Training.

Hot projects: Mary Brindel explores the strategies for exposing IT staff to projects that keep them challenged and happy. Plus: The 10 Best Places for Hot Projects.

MODEL EMPLOYERS

IF YOU'RE A TECHNOLOGY manager, you know firsthand how difficult it is to hire qualified IT staff. And though some managers report seeing retention numbers creep up, hiring can still be a challenge, even in the current economic slowdown.

The message is clear: Technology staffers who are good at what they do still have a wide selection of employers to choose from. And the only way to attract the best employees is to be one of the best employers.

That means offering employees not just top compensation but also opportunities for career growth, investment in training, diversity in the workplace, work flexibility and, ideally, a comfortable and fun place to spend their daytime hours.

How do you do it? To help you find out, Computerworld has compiled its eighth annual list of the 100 Best Places to Work in IT. Based on the criteria that prospective employees find most important, companies were measured on diversity, training, career development, benefits, hot projects and retention. These measures were combined to select the best overall firms.

It turns out that these desired employers have a lot in common. Beyond the great training, great opportunities, great benefits and great diversity it took to get them to the top in the first place, we found a lot of common ground in the corporate philosophies of these companies and the way they deal with IT. Here's a look at three key themes:

The key to being a top employer in tough times is fostering close relationships – management to staff, IT to business and individuals to the overall company strategy. By Minda Zetlin

IT is central to the best employers' success.

Of course, many firms these days claim that technology, especially the Internet, is part of their central mission. But for those that made it to the top of the list, excellence in IT is a fundamental part of corporate strategy. This is a no-brainer for employers such as Atlanta-based The Home Depot Inc. (No. 1 on the list), which keeps retail prices low and depends on a complex distribution and inventory system to stay profitable.

It's equally obvious why the insurance and financial services firms that made it to the top consider IT to be of strategic importance — they deal in information almost exclusively.

The reasoning may be less obvious for Las Vegas-based Harrah's Entertainment Inc. (No. 2). One doesn't necessarily think of the casino business as on the cutting edge of IT. But Harrah's marketing strategy depends on building complex relationships with repeat customers via sophisticated data mining.

And although many people assume that New York-based Avon Products Inc. (No. 4) is a low-tech firm, the positive is true, explains CIO and Senior Vice President Harriet Edeleman. "When people think of Avon, they think of a relationship-based environment in one of its most basic forms," she says.

But the company processes more than 60 million custom orders per year at facilities around the globe. "It's a highly complex, very punishing supply chain and a highly transactional business," Edeleman says. And Avon could-

n't do this without powerful technology to back it up, she adds.

Management takes an active interest in employees' careers from the day they arrive.

At the best places to work, technology employees know that their company cares about their future from the moment they walk in the door.

"As individuals join our organization, they immediately begin working on a development plan with their managers," says George McKinnon, vice president and CIO at Nationwide Insurance Cos. (No. 3) in Columbus, Ohio. Employees meet with their managers every quarter for a formal review to assess the plan and check on its progress.

"We want to help people achieve both their personal goals and their aspirations as employees," McKinnon explains.

At Milwaukee-based Harley-Davidson Inc. (No. 11), every new employee starts with a three-day orientation program. "It covers all areas of the business and all our business processes," says Cory Mason, director of information services. "And it gives a really good grounding in the culture of the company."

For IT staff, the general orientation is followed by a half-day orientation that gets them familiar with the systems Harley-Davidson uses and with how the company's information services department operates. Then, once a year, employees go through a self-assessment against the established competencies for their jobs, and their supervisors do the same, "purely for career development purposes," Mason says.

Every information services position at Harley-Davidson has its competencies mapped out in this way, Mason says. "They can look at any job in IS and get an idea of the skills they need for that job," he says. "Ultimately, employees need to be responsible for their own careers. But it's much easier to do if you have complete information."

And at these top companies, interest in employees' careers continues

BUSINESS SPECIAL REPORT

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throughout their time with the company. For example, because most managers believe having a mentor helps with career growth, many of the top places to work have formal mentoring programs. These programs match employees with more experienced counterparts who teach needed skills and who may offer career guidance.

"We have both a knowledge mentoring program and a career mentoring program, where we are identifying employees to fill leadership positions in the short and long term," says Bob Baggett, systems manager at State Farm Mutual Automobile Insurance Co. (No. 13) in Bloomington, Ill.

Jami Schweitzer, college campus coordinator at State Farm's systems de-

partment, started with the company a year ago and went through the knowledge mentoring program herself. She says the program is so successful that State Farm is now expanding it to employees who haven't even arrived yet. Starting this fall, the company will begin assigning mentors to college students who plan to join the company when they graduate.

■ There are no walls between business and IT.

Strikingly, all of the IT executives we spoke with at the Best Places to Work stressed that IT people and business people work side by side in their companies. Giving technologists a better understanding of what the business

the business succeed and leads to career satisfaction for IT professionals.

In fact, according to Eileen Cassini, vice president of IT services at Harrah's, letting IT staff learn about the business was a key part of a major IT overhaul five years ago.

Part of the change was taking care of what she calls "hygiene factors" — basic issues such as compensation, training opportunities and workplace flexibility — that would have caused IT employees to depart for greener pastures if Harrah's didn't keep pace with competing employers.

But beyond that, "one of the things we focused on is connecting the employee to the business. They know exactly how they contribute to the revenues of the company every day and how important they are in the business," Cassini says.

The overhaul reduced Harrah's IT turnover rate from 35% to 5% in one year, she says. Equally important is that, of those who do leave, many return after a few months, she adds.

And at many Best Places to Work, the close relationship between business and IT allows people to switch between the two areas. In fact, State Farm has found that a growing number of IT staffers are making the transition to becoming insurance agents.

At Harley-Davidson, cross-functional work teams give IT workers a sense of the business as a whole, Mason says.

What are the benefits to working this way for IT professionals? "I think it gives them career development," Mason says. "It gives them an ability to be more effective as information services professionals so they'll have the ability to come up with a superior solution. It gives them the opportunity to learn what's going on in the business outside information services."

Thus, at the top places to work, several different career tracks are available. IT specialists may advance by taking on management roles within technology, or, because there are no walls between technology and business, they may wind up moving into business management positions. Those who don't love managing people can climb the ladder by taking on special technology challenges and may wind up reporting directly to the CIO. ■

Zellin is a freelance writer in Woodstock, N.Y.

MORE ONLINE

Learn how to stay a Best Place to Work in a tough economy with some low-cost retention strategies.
www.computerworld.com/bestplaces

100 BEST PLACES TO WORK IN IT



From the Editor

Who could have imagined the changes in the IT job market this year? Dot-coms have gone from the place to work to the last place most IT professionals would take a job.

Job seekers have gone from having their pick of multiple offers to finding themselves in competition for open slots. Students have gone from landing jobs even before their tenure year to finding out that jobs they were promised no longer exist.

But if professionals remain very fuzzy about who they want to work for, for the hiring manager, the surest way to attract and keep skilled IT talent is to be known as an employer of choice — a Best Place to Work. To help you understand what that means, Computerworld has conducted its annual survey of the top 100 employers for IT professionals. Their strategies include the following:

- Providing training, education and resources.
- Offering flexible and generous benefits packages.
- Encouraging diversity hiring and providing mentors to minority workers.
- Giving workers access to projects that will help them stay challenged.
- Fostering an atmosphere of fun, creativity and respect.
- Helping employees map out and pursue their career goals.

When you succeed at these efforts, finding IT workers and keeping the ones you have will come naturally.

Dick Wallen

100 BEST PLACES TO WORK IN IT

BUSINESS SPECIAL REPORT

Methodology

Computerworld's Eighth Annual
100 Best Places to Work in IT Study

COMPUTERWORLD June 4, 2001

FOR THE EIGHTH YEAR IN A ROW, Computerworld conducted a survey to identify the 100 best places to work for IT professionals. From January 2001 through March, Computerworld invited CIOs, vice presidents and IT directors at U.S.-based companies

to participate in the survey. Respondents submitted information about their IT organizations online at Computerworld.com.

Computerworld's 75-question online survey asked about the organizations' benefits, training and develop-

Rank	Organization name	Primary business	IT headquarters location	Web address	# IT workers	% of staff employed five years or more	% of IT staff promoted
1	The Home Depot Inc.	Retail	Atlanta	www.homedepot.com	6	75	44
2	Hearst's Entertainment Inc.	Entertainment/Hospitality	Las Vegas	www.hearst.com	4	7	32
3	Nationwide Insurance Co.	Insurance	Columbus, Ohio	www.nationwideinsurance.com	6	7	29
4	Axon Products Inc.	Consumer products	Rye, N.Y.	www.axon.com	10	8	26
5	International Truck and Engine Corp.	Automotive	Chicago	www.intertionaltrucks.com	3	16	35
6	The Vanguard Group Inc.	Financial services	Malvern, Pa.	www.vanguard.com	8	5	19
7	Avnet Inc.	Distribution	Phoenix	www.avnet.com	5	14	25
8	FirstCall Financial Corp.	Financial services	Boston	www.firstcall.com	12	10	25
9	USAA	Financial services	San Antonio	www.usaa.com	11	9	26
10	Primerica/PrimericaPlus	Professional services/consulting	Edison, N.J.	www.primerica.com	24	3	34
11	Harley-Davidson Inc.	Motorcycle manufacturing	Milwaukee	www.harley-davidson.com	5	5	16
12	IBM	Technology	Armonk, N.Y.	www.ibm.com	8	8	9
13	State Farm Mutual Automobile Insurance Co.	Insurance	Bloomington, Ill.	www.statefarm.com	2	11	23
14	EPIC Systems Inc.	Financial services	Kansas City, Kan.	www.epicsystems.com	5	2	30
15	Cabot Corp.	Chemicals	Boston	www.cabot-corp.com	4	10	10
16	Towers Perrin	Professional services/consulting	New York	www.towers.com	15	7	38
17	PBS	Educational broadcasting	Alexandria, Va.	www.pbs.org	7	6	29
18	Technichgold.com	Staffing	Boston	www.technichgold.com	10	2	75
19	Memory Interactive Corp.	Application testing	Sunnyvale, Calif.	www.memoryinteractive.com	2	4	50
20	State Street Corp.	Financial services	Boston	www.statestreet.com	10	7	16
21	United Stations Inc.	Wholesale	Des Plaines, Ill.	www.unitedstations.com	4	9	34
22	The Earthgrape Co.	Food	St. Louis	www.earthgrape.com	10	10	40
23	Sears, Roebuck and Co.	Retail/financial services	Hoffman Estates, Ill.	www.sears.com	10	8	15
24	Tesco Corp.	Offices exploration/mining	Old Greenwich, Conn.	www.tesco.com	5	5	18
25	AT&T Corp.	Telecommunications	Basking Ridge, N.J.	www.att.com	6	15	38
26	Wal-Mart Stores Inc.	Retail	Bentonville, Ark.	www.wal-mart.com	9	5	25
27	The Money Group Inc.	Financial services	Syracuse, N.Y.	www.money.com	6	14	19
28	Burlington Coat Factory Warehouse Corp.	Retail	Burlington, N.J.	www.coat.com	7	4	7
29	General Mills Inc.	Food	Minneapolis	www.generalmills.com	1	12	12
30	Acision Corp.	Professional services/consulting	Little Rock, Ark.	www.acision.com	10	5	26
31	Foraytek Technology Inc.	Professional services/consulting	Sieke, Ill.	www.foraytekolutions.com	22	3	10
32	FeeFax Corp.	Transportation	Memphis	www.fefax.com	9	8	26
33	J.B. Hunt Transport Services Inc.	Transportation	Lewisville, Ark.	www.jbhunt.com	11	6	26
34	Dunn & Co.	Industrial/farm equipment	Moline, Ill.	www.dunn.com	4	25	20
35	TECO Energy Inc.	Utilities	Tampa, Fla.	www.tecoenergy.com	3	12	17
36	SAS Institute Inc.	Computer software	Cary, N.C.	www.sas.com	2	10	22
37	Capital One Financial Corp.	Financial services	Falls Church, Va.	www.capitalone.com	9	2	26
38	Scientific-Atlanta Inc.	Telecommunications	Lanhamsville, Ga.	www.scientificatlanta.com	11	8	10
39	The CIT Group Inc.	Financial services	Lyndhurst, N.J.	www.cit.com	5	5	36
40	Cigna Corp.	Insurance	Philadelphia	www.cigna.com	8	11	27
41	Gilbane International Inc.	Global travel/distribution	Rosemont, Ill.	www.gilbane.com	5	5	9
42	Georgia-Pacific Corp.	Forest and paper products	Atlanta	www.gpc.com	11	7	14
43	Network Appliance Inc.	Technology	Sunnyvale, Calif.	www.netapp.com	4	2	10
44	Bosch Corp.	Consumer electronics	Franklin, Mass.	www.bosch.com	10	5	20
45	Best Buy Co.	Retail	Eden Prairie, Minn.	www.bestbuy.com	10	3	17

BUSINESS SPECIAL REPORT

ment, average salary increases, percentage of staff promoted, turnover rates and the percentage of women and minority employees on staff and in IT management positions. In addition, information was collected on each organization's hot projects, men-

toring programs and benefits, ranging from elder care and child care to flextime and stock options.

The final ranking was based on the results of the 75-question survey and wasn't limited to the data presented below. All quantitative data was scored

separately and given equal weight in determining the final ranking. Rankings were based on the status of and information from the companies at that time.

Approximately 225 companies qualified for consideration as Best Places to Work in IT.⁹

Companies annual publication survey	Number of times IT staff is evaluated	Offices monitoring programs	% of IT staff who are female	% of female IT managers	% of IT staff who are minorities	% of minority IT managers	Average days of training/year	Average cost of training	Change in IT training budget for 2001
Yes	Twice a year	No	36	26	25	14	17	\$6,200	Increase
Yes	Twice a year	Yes	47	43	19	27	14	\$7,200	Increase
Yes	Once a year	Yes	48	56	23	15	15	\$7,852	Increase
Yes	Twice a year	Yes	41	33	25	14	10	\$10,000	Remain the same
Yes	Twice a year	Yes	40	25	15	15	5	\$6,700	Increase
Yes	Once a year	No	32	34	23	6	15	\$8,000	Increase
Yes	Twice a year	Yes	24	22	20	10	10	\$3,000	Increase
Yes	Twice a year	Yes	45	36	11	8	7	\$8,200	Remain the same
No	Twice a year	Yes	39	31	34	22	6	\$7,200	Remain the same
Yes	At least three times a year	Yes	35	15	27	9	15	\$7,907	Increase
No	At least three times a year	Yes	35	25	14	9	13	\$5,050	Increase
Yes	Once a year	Yes	26	36	23	16	9	\$7,200	Remain the same
Yes	Twice a year	Yes	43	32	9	11	11	\$4,590	Increase
No	Twice a year	No	30	100	20	0	10	\$7,200	Remain the same
No	Twice a year	No	14	5	41	10	10	\$5,000	Increase
No	Once a year	No	34	.7	16	2	10	\$10,000	Remain the same
No	Once a year	No	26	15	46	50	15	\$8,000	Increase
Yes	At least three times a year	Yes	10	0	15	0	15	\$5,000	Remain the same
Yes	Once a year	Yes	45	0	33	50	15	\$3,500	Increase
Yes	Once a year	Yes	39	26	21	13	15	\$5,500	Increase
Yes	Twice a year	Yes	43	23	15	18	9	\$3,600	Increase
Yes	Once a year	No	40	25	15	3	10	\$5,000	Remain the same
Yes	Twice a year	Yes	40	34	21	15	13	\$4,000	Increase
Yes	Twice a year	No	26	23	21	15	8	\$4,000	Remain the same
Yes	At least three times a year	Yes	46	45	20	20	12	\$2,500	Increase
Yes	Once a year	Yes	34	5	14	5	25	\$4,300	Increase
Yes	Twice a year	Yes	46	45	14	11	8	\$4,000	Increase
Yes	Once a year	Yes	27	27	14	13	8	\$5,000	Increase
Yes	Twice a year	Yes	43	40	10	4	7	\$3,200	Remain the same
Yes	Once a year	Yes	35	14	14	4	7	\$4,500	Increase
No	At least three times a year	Yes	23	6	27	2	15	\$10,000	Remain the same
Yes	Once a year	Yes	40	35	27	17	10	\$3,500	Remain the same
Yes	Twice a year	Yes	33	43	13	0	11	\$5,500	Increase
No	Once a year	No	34	16	5	6	10	\$4,000	Remain the same
No	At least three times a year	Yes	40	57	20	25	12	\$2,750	Remain the same
Yes	Twice a year	No	36	36	13	7	6	\$2,500	Increase
Yes	Twice a year	Yes	33	23	22	14	10	\$3,500	Increase
Yes	Twice a year	Yes	38	32	34	35	10	\$4,400	Increase
No	At least three times a year	No	30	47	16	21	5	\$2,500	Remain the same
Yes	Twice a year	Yes	45	41	16	15	9	\$2,000	Remain the same
No	At least three times a year	Yes	40	36	10	19	8	\$3,000	Increase
Yes	Twice a year	Yes	38	31	37	41	12	\$3,000	Increase
Yes	Twice a year	Yes	31	2	28	2	14	\$3,000	Increase
Yes	At least three times a year	No	60	30	25	0	9	\$3,000	Remain the same
Yes	Once a year	Yes	30	25	13	5	9	\$4,000	Remain the same

Rank	Company name	Primary business	U.S. headquarters location	Web address	% of IT turnover	No. of staff employed five years or more	% of IT staff promoted
46	Aetna Inc.	Health benefits	Hartford, Conn.	www.aetna.com	5	13	20
47	Battelle Memorial Institute	Professional services	Columbus, Ohio	www.battelle.org	9	7	20
48	Texas Instruments Inc.	Electronics/electrical equipment	Dallas	www.ti.com	3	16	18
49	Minnesota Life Insurance Co.	Insurance	St. Paul, Minn.	www.minnestomutual.com	10	9	30
50	West Group	Electronic information	Eagan, Minn.	www.westgroup.com	7	7	19
51	Charles Schwab & Co.	Financial services	San Francisco	www.schwab.com	11	3	17
52	Gartner Inc.	Consulting	Stamford, Conn.	www.gartner.com	16	7	20
53	SCT Corp.	Technology	Mt. Laurel, Pa.	www.sctcorp.com	5	5	32
54	DPR Construction Inc.	Construction	Redwood City, Calif.	www.dprinc.com	Less than 1	3	9
55	American Management Systems Inc.	Consulting	Fairfax, Va.	www.ams.com	15	3	5
56	Florida Power & Light Co.	Utilities	Juno Beach, Fla.	www.fpl.com	11	8	27
57	Hewitt Associates	Consulting	Uncasville, R.I.	www.hewitt.com	9	5	30
58	Mutual Financial Corp.	Financial services	Pittsburgh	www.muton.com	10	10	31
59	Analysts International Corp.	Technology consulting	Minneapolis	www.analysts.com	5	8	9
60	Axa Financial Inc.	Financial services	New York	www.axa-financial.com	8	10	27
61	Lands' End Inc.	Apparel	Dodge City, Kan.	www.landsend.com	7	7	26
62	Royal Caribbean Cruises Ltd.	Hospitality	Miami	www.rcl.com	16	4	10
63	American Family Life Assurance Co. of Columbus	Insurance	Columbus, Ga.	www.usaa.com	11	9	24
64	Caterpillar Inc.	Construction and mining equipment	Peoria, Ill.	www.cat.com	4	25	34
65	People's Energy Corp.	Utilities	Chicago	www.peoplesenergy.com	6	10	7
66	SEI Investments Co.	Financial services	Drexel, Pa.	www.sei.com	5	5	10
67	Ventra Corp.	Professional services	McLean, Va.	www.ventra.com	6	2	10
68	Prudential Financial	Financial services	Newark, N.J.	www.prudential.com	13	9	21
69	Household International Inc.	Financial services	Prospect Heights, Ill.	www.household.com	10	7	26
70	LedgerPoint North Management & Data Systems	Technology	Philadelphia	http://www.lnd.com	15	8	23
71	CDW Computer Centers Inc.	Computers/office equipment	Vernon Hills, Ill.	www.cdw.com	23	2	10
72	Freddie Mac	Financial services	McLean, Va.	www.freddiemac.com	19	5	30
73	The PNC Financial Services Group Inc.	Financial services	Pittsburgh	www.pnc.com	9	10	20
74	America's Electric Power Co.	Utilities	Columbus, Ohio	www.aep.com	9	11	16
75	Statek Inc.	Consulting	Cambridge, Mass.	www.statek.com	N/A	1	20
76	SuperValu Inc.	Distribution	Eden Prairie, Minn.	www.supervalu.com	9	10	25
77	Electronic Data Systems Corp.	IT services provider	Plano, Texas	www.edsc.com	11	8	N/A
78	Roadway Express Inc.	Transportation	Arlon, Ohio	www.roadway.com	3	9	15
79	Office Depot Inc.	Retail	Delray Beach, Fla.	www.officedepot.com	12	3	15
80	KPMG Consulting Inc.	Consulting	McLean, Va.	www.kpmgconsulting.com	26	8	20
81	Edison International and Southern California Edison	Utilities	Rosemead, Calif.	www.sce.com	6	11	6
82	Monopolies Group Inc.	IT services	Rochelle, Md.	www.monopolies.com	5	5	10
83	Allstate Insurance Co.	Insurance	Northbrook, Ill.	www.allstate.com	10	10	9
84	John Hancock Financial Services Inc.	Insurance	Boston	www.jhancock.com	15	11	24
85	United Parcel Service Inc.	Transportation	Atlanta	www.ups.com	5	8	8
86	GATX Rail Corp.	Transportation	Chicago	www.gatx.com	17	11	11
87	NCR Corp.	Consulting	Dayton, Ohio	www.nrc.com	7	10	5
88	Master Graphics Corp.	Software	Wisconsin, Wis.	www.master.com	25	8	9
89	Eastman Chemical Co.	Chemicals	Kingsport, Tenn.	www.eastman.com	1	30	15
90	National City Corp.	Financial services	Cleveland	www.national-city.com	11	8	22
91	Staples Inc.	Retail	Framingham, Mass.	www.staples.com	22	5	25
92	Comcast Inc.	Financial services	Detroit	www.comcast.com	9	8	16
93	UnitedHealth Group Inc.	Health care	Minnetonka, Minn.	www.unitedhealthgroup.com	15	7	17
94	Conwest Inc.	Computers/office equipment	Bloomington, Ill.	www.conwest.com	17	3	29
95	HCA Information Technology & Services Inc.	Health care	Nashville	www.hca.com	10	8	20
96	Regions Financial Corp.	Banking	Birmingham, Ala.	www.regionbank.com	6	6	22
97	Scansite Industry Automation Corp.	IT services	Brooklyn, N.Y.	www.scansite.com	14	9	20
98	RadioShack Corp.	Retail	Fort Worth, Texas	www.radioshack.com	8	12	10
99	TRW System & Information Technology Group	Consulting	Reston, Va.	www.trw.com	19	9	29
100	J.C. Penney Co.	Retail	Plano, Texas	www.jcpenney.com	13	14	21

BUSINESS

Conducts annual satisfaction survey	Number of times IT staff is evaluated	Offers mentoring programs	% of IT staff who are female	% of female IT managers	% of IT staff who are minorities	% of minority IT managers	Average days of training/year	Average cost of training	Change in IT budget for 2001
No	At least three times a year	Yes	45	31	12	9	6	\$3,000	Increase
No	Once a year	No	40	35	30	25	10	\$3,000	Increase
Yes	At least three times a year	Yes	32	25	21	12	5	\$2,900	Decrease
Yes	Once a year	Yes	44	53	7	1	13	\$2,272	Increase
Yes	Once a year	Yes	37	39	11	1	10	\$3,000	Increase
Yes	At least three times a year	Yes	37	26	31	17	7	\$3,800	Remain the same
Yes	At least three times a year	No	40	10	30	5	10	\$4,000	Increase
Yes	Once a year	No	31	32	17	5	5	\$2,000	Remain the same
Yes	Twice a year	No	21	20	29	20	7	\$2,000	Increase
Yes	Once a year	No	25	26	25	18	8	\$5,000	Remain the same
No	Twice a year	Yes	36	38	42	33	8	\$3,000	Remain the same
Yes	Once a year	Yes	38	15	15	7	7	\$2,000	Increase
Yes	Twice a year	Yes	32	36	18	8	9	\$1,900	Increase
Yes	Once a year	No	23	64	23	11	5	\$2,500	Increase
Yes	Once a year	No	32	12	28	11	6	\$2,400	Remain the same
Yes	Twice a year	No	31	30	1	0	10	\$3,500	Decrease
Yes	At least three times a year	Yes	31	44	52	54	7	\$3,500	Increase
Yes	Once a year	Yes	50	38	23	18	7	\$2,800	Increase
Yes	Once a year	Yes	36	28	7	6	9	\$1,880	Increase
No	At least three times a year	No	36	36	32	16	8	\$2,500	Increase
No	Once a year	No	28	10	35	10	80	\$2,000	Remain the same
Yes	At least three times a year	Yes	16	3	20	5	5	\$3,000	Remain the same
Yes	Twice a year	Yes	33	28	17	13	8	\$2,300	Increase
Yes	Twice a year	Yes	42	35	27	11	10	\$1,900	Increase
Yes	Once a year	Yes	23	20	15	11	5	\$2,000	Increase
No	Once a year	Yes	23	18	24	9	9	\$4,500	Remain the same
Yes	Twice a year	Yes	45	39	36	29	12	\$2,500	Increase
Yes	Once a year	Yes	36	28	7	3	10	\$2,200	Increase
Yes	Twice a year	No	37	29	11	11	4	\$2,500	Remain the same
Yes	Twice a year	Yes	12	7	11	5	20	\$5,000	Remain the same
Yes	Once a year	Yes	28	15	15	5	6	\$2,500	Remain the same
Yes	At least three times a year	Yes	35	34	25	21	10	\$3,150	Increase
Yes	Once a year	Yes	75	5	9	5	3	\$2,500	Remain the same
No	Once a year	Yes	36	27	27	19	10	\$3,000	Remain the same
Yes	Twice a year	Yes	35	12	39	18	5	\$3,000	Increase
Yes	Twice a year	Yes	40	7	48	9	8	\$1,500	Increase
Yes	Twice a year	Yes	22	25	25	25	5	\$1,500	Increase
Yes	Twice a year	No	43	35	27	17	15	\$1,800	Increase
No	Twice a year	Yes	44	48	18	7	10	\$2,000	Remain the same
Yes	Twice a year	Yes	28	22	25	15	8	\$7,170	Increase
No	Once a year	No	52	64	20	7	5	\$3,500	Remain the same
Yes	At least three times a year	Yes	33	24	14	6	5	\$2,800	Decrease
No	Once a year	No	27	21	25	21	5	\$3,000	Increase
Yes	Once a year	No	24	1	1	0	8	\$1,000	Increase
Yes	Twice a year	Yes	34	35	13	6	10	\$1,306	Increase
Yes	Twice a year	Yes	40	11	14	3	8	\$3,500	Increase
Yes	Twice a year	No	47	7	22	3	4	\$1,811	Increase
Yes	Once a year	Yes	46	35	14	4	6	\$1,000	Increase
No	Twice a year	No	29	31	32	6	8	\$2,450	Increase
Yes	Once a year	No	43	36	15	5	5	\$1,754	Increase
Yes	At least three times a year	Yes	42	30	21	15	11	\$816	Increase
No	Twice a year	No	18	14	26	14	5	\$2,250	Remain the same
Yes	Twice a year	Yes	40	30	18	15	10	\$1,500	Increase
Yes	Once a year	No	21	17	19	3	5	\$2,500	Remain the same
Yes	Once a year	No	39	20	24	10	4	\$1,200	Remain the same

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WORKSTYLES

Stability in IT Helps CIO Focus On Integrating Acquisitions

Interviewee: Steve Bratton, vice president of business systems and COO

Company: The English Bread Co., a \$2.6 billion bread and baked goods company

Main location: St. Louis
Number of IT employees: 120
That's come up in the past year by 2% or 3%. I don't see it going over the next 18 months."

Total number of employees: 20,000

Typical workday: "Usually 8 a.m. to 5 p.m. If we have some type of project we're running behind, it's longer. But I can't recall anything like that in the past six months."

Atmosphere: "There are meetings for projects and status, but most everybody's working on their projects and coordinating them with each other. I'm 25% to 30% of my time per week. It's manageable."

How long have you been at the company? 10 years.

So you have your job down to a science? "Pretty much. You know a lot about [people's] personal lives and what's going on with them. I try to keep a distance, though. I believe the other managers who can be very close with every body and still make tough business decisions. But I try to get people happy. You notice whether people are working long. If they're working late, you start to get concerned."

How do you keep tabs on staff morale? "I try to get feedback from project managers. How are things going? Are people happy? You notice whether people are working long. If they're working late, you start to get concerned."

Dress code: Business casual. That's what I wear."

Budgets: "Most of our staff has a pay raise. Some will have cost-of-living increases. None doesn't ring me out."

Upcoming projects: "We're looking at a business intelligence initiative." -SRA, age 46

Response: "We probably won't offer specific IT acquisition budgets."

What are you with the data warehousing project?

"Requirements analysis. We are probably just in the first 10% of the total 120 days. We'll have more work in two to three years."

Favorite recent project: "The

past year we've been integrating the acquisitions we've made. The bubble's been

been interesting."

Our focus has been on integrating those businesses into our SAP R/3 systems."

What was the biggest deal? "[The \$625 million acquisition of] Mett Balence Co. increased our base business by 50%. It took our manufacturing facilities from 40 to 61. Then we added another 1,500 sales

location sites and 5,000 new employees. If you add in the 5625 million growth, to get the newly acquired company integrated is been impossible so you can leverage the synergy and run just business as one company."

Was IT involved in early discussions, when the acquisition was just an idea?

"Yes. The projected strategic

ture spending and integration

area - all that was included in the economics of it if it would

"take it to the acquisition. We were there to tell them 'Hey, it's a big deal!'

Is the work [which started in October] close to being done? "We're about four months away."

One thing everybody complains about: "I think the issue is not knowing what they're going to bring in. They want to know you're 12 or 18 months from now. That's the tough part for us to manage which project and when and which ones they are going to get funded."

-Kris S. Nash

BUSINESS

Bubble Trouble

WHILE MOST CORPORATE IT budgets are being prepared for surgery, consultants and magazines are ready to cheer up the patients by saying that all is well. They say that the big IT spending spree that was so typical of the past several years will continue, regardless of how much the economy will be hurting. In fact, they say, IT spending will rise faster than ever!

I first detected the existence of explosive IT growth predictions last fall. A senior researcher from Gartner announced that the growth rate of IT expenditures will accelerate, reaching — on average — 10% of U.S. corporate revenues by 2005. I don't usually pay attention to percentage-of-revenue benchmarks because they vary from 0.1% for natural resources firms to a New York investment bank that spends 10% of revenue on IT, spending more than \$700,000 on IT per employee. The idea that U.S. averages would approach by 2005 what I consider close to a maximum spending limit was so far-fetched that the prophecy couldn't be dismissed.

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One way to test the credibility of any forecast is to give it a sanity check. If true, does it make sense? I examined spending statistics for 8,960 U.S.-listed corporations with total rev-

enues of more than \$5 trillion. I then projected estimates of average IT spending based on 8%, 25% and 20% to 40% of revenues.

The results (see chart) were astounding. The projected growth rates are based on my best estimates of current spending levels; IT spending as a percentage of revenue was 14.6% median IT budget per employee, \$8,609; and median IT budget for total compensation, 17.1% and median IT budget, \$4.7 million. The figure for median IT budget per employee takes into account the fact that 41% of employees aren't information workers and, therefore, not significant IT users.

None of the three IT-revenue ratio forecasts is believable. Their projected average IT spending growth rates of 24%, 18% and 17% would surpass even the most optimistic projections in employee payroll as well as any other corporate indicator, including profits, head count and administrative expenses. Further, the future IT spending numbers are in current dollars, and IT costs are supposed to be decreasing according to Moore's Law. Therefore, it defies comprehension to try to understand how the amount of actual computing power we would be buying would increase profits sufficiently to pay for the enormous IT bills.

When next year's budget plans come up for review later this year, it may be foolish to refer to spending forecasts to justify accelerated spending. By all means, spend money on IT if there's a demonstrable payoff. But beware of those who inflate bubbles beyond realistic limits. Somebody who's reviewing your spending plans may puncture that bubble. ■

Wild Predictions?
Here's what firms would have to spend in 2004 to match three recent IT/percentage-of-revenue benchmarks and the implications of those predictions:

	Median IT budget/ headcount (employees)	Median IT budget/ total comp (percent)	Median IT budget (million) (percent)	Average growth rate
8%	\$15,865	33%	\$10.8	24%
25%	\$46,578	104%	\$32.8	118%
20-40%	\$68,410	145%	\$45.8	174%

Paul A. Strassmann (paul@strassmann.com) has written extensively about the troubles that can be traced to benchmarks based on IT-revenue ratios.

WORKSTYLES

Stability in IT Helps CIO Focus On Integrating Acquisitions

Interviewee: Steve Bracke, vice president of business systems and COO

Company: The Earthtones Co., a \$2.6 billion bread and baked goods company

Main location: St. Louis

Number of IT employees: 120. "That's gone up in the past year by 2% or 3%. I don't see it growing over the next 18 months."

Total number of employees: 20,000

Typical workflow: "Usually 8 a.m. if we have some type of project we're running behind, or it's longer. But I can't recall anything like that in the past six months."

Atmosphere: "There are meetings for projects and status, but most everybody's working on their projects and communicating back with each other. I'm 25% or 30% in meetings per week. It's manageable."

How long have you been at the company? 15 years.

So you have your job down to a science? "Pretty much. You know a lot about [people's] personal lives and what's going on with them. You try to keep a distance, though. I admire the other managers who can be very close with everybody and still make tough business decisions. But ... I get too close. I may not be able to make objective decisions."

How do you keep tabs on staff morale? "I try to get feedback from project managers. How are things going? Are people happy? You notice whether people are working too long, if they're working late, you try to get concerned."

Dress code: Business casual; Dockers and polo shirts.

Budgets: "Most of our staff has a paper. Some will have cell phones. Mine doesn't have much."

Upcoming projects: "We're working on a business-intelli-

gence initiative - data warehousing. Then probably some other shop-floor automation."

Where are you with the data warehousing project? Requirements definition. We will probably start construction in the next 90 days. Vendors are narrowed to two at this point.

Favorite recent project: "For

the past year, we've been integrating the acquisitions we've made. The baking business

has been consolidating.

Our focus has been on integrating those businesses into our SAP R/3 systems.

What was the biggest deal? "[The \$625 million acquisition of] Metz Baking Co. increased our base

business by 50%." It

took over Metz's manufacturing facilities from 40

to 61. Then we added another 1,500 em-

ployees. If you're going to invest

\$625 million, you have to get

the newly acquired company in-

tegrated as soon as possible, so

you can leverage the synergy

and run that business as one big deal."

Was IT involved in early discussions, when the acquisition was just an idea?

"Yes. The projected infrastruc-

ture spending and integration

work - all that was included

in the economics of what it would

take to do the acquisition. We

were there to tell them, 'Hey, it's

a big deal.'

Is the work [which started in October] close to being done? "We're about four months away."

One thing everybody com-

plains about: "Then the issue

is not knowing what they

are trying to accomplish. They

want to know an 18 or 20

months from now. That's the

tough part for us to manage -

which project and when

which projects are going to get

funded."

- Kim S. Nash

PAUL A. STRASSMANN

Bubble Trouble

WHILE MOST CORPORATE IT budgets are being prepared for surgery, consultants and magazines are ready to cheer up the patients by saying that all is well. They say that the big IT spending spree that was so typical of the past several years will continue, regardless of how much the economy will be hurting. In fact, they say, IT spending will rise faster than ever!

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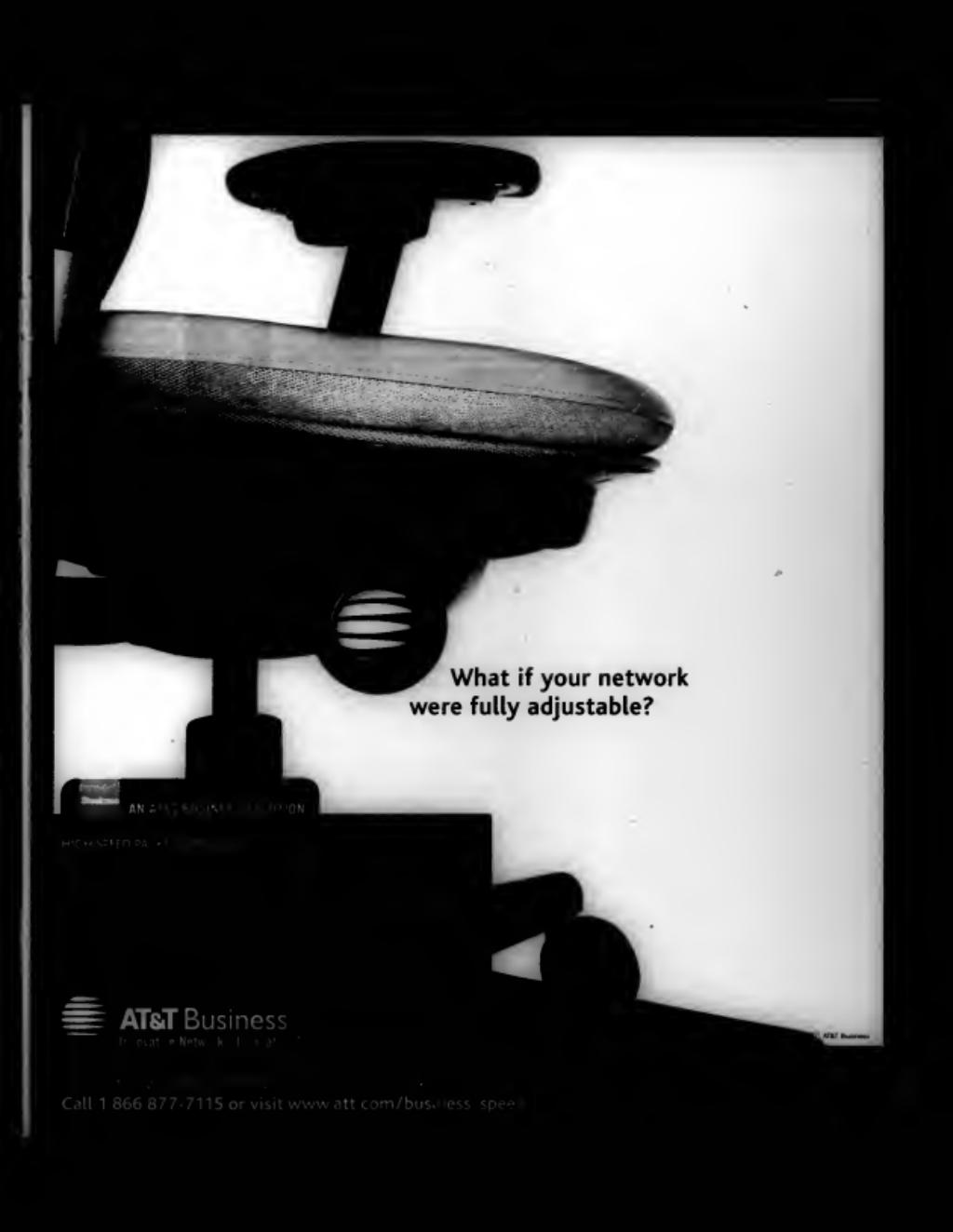
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IT Predictions?

Here's what firms would have to spend in 2004 to match three recent IT/revenue-of-revenue benchmarks and the implications of those numbers.

Percent of revenue	Median IT budget per employee	Median IT budget for total compensation	Median IT budget
8%	\$55,000	33%	\$15.5M
25%	\$40,678	104%	\$82.5M
20-40%	\$60,410	146%	\$40.5M

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Using Behavioral Science to Boost CRM

Understanding how customers think and feel is the key to effective service, according to an article in this month's issue of *Harvard Business Review* by **Richard B. Chase**, professor of operations management at the University of Southern California's Marshall School of Business in Los Angeles, and associate professor **Sriram Dasu**.

Chase spoke with Computerworld's **Kathleen Melymuka** about how the design of service-oriented IT systems can

benefit from innovations in behavioral science.

Q: Shouldn't IT managers be less concerned with customers' feelings than with metrics like speed and error prevention?

A: Many Web interactions are like trying to find your way through a maze.

You may make it through quickly and not make errors, but the process may not leave you feeling that you had a pleasant experience. Feelings are something that IT managers rarely

This is the first in a series of monthly discussions with authors of articles in the Harvard Business Review on topics of interest to IT managers.

focus on. [But they're] critical in designing systems that customers will actually want to use.

Q: Why is the end of a service encounter much more important than the beginning?

A: People anchor on the last part of a service encounter in their recollections. While it is critical to reach a threshold level of good performance at the start, it is even more important to finish strong. When I purchased a book from Amazon, fireworks should go off.

Q: In your article, you say that it's

important to get the bad news out of the way early during a help desk or customer service call. Why?

A: People prefer positive trends in their service encounters. They also fear the unknown. You are much better off telling someone upfront. "The bad news is your motherboard is no longer functional; the good news we can get you in one hour or less." It's a lot worse to temporize, creating greater ambiguity and stress.

Q: Many CRM [customer relationship management] systems are tree-based, with several steps to the final destination. Why is that

a bad thing, and what is an alternative?

A: People remember events as taking longer if they are segmented. [And multiple steps mean] multiple possibilities for screw-ups. An alternative: Have a bot or virtual representative have a natural-language discussion with us about what we want. You can find an example of this capability in Carnegie Mellon's Informedia Digital Library project.

Q: You say that a feeling of control is even more important to customers than the speed of the encounter. How can companies and developers help foster those feelings?

A: Having 24/7 accessibility is only the beginning. Customers want to be able to choose to use a chat room, have multiple ways of getting answers to questions, choose when to respond and the format they use.

You could provide access via mobile [personal digital assistants], allowing your customers to control where, as well as when, they access your system.

Q: Why are rituals important in a service encounter? Can you suggest some?

A: Rituals make us feel comfortable, [but] most Web rituals are neutral or negative for example, the horrible sound I get from my Internet dial-up connection.

People need to be thinking about rituals: Is there a way to replicate handshakes and smiles? [Can] the same virtual representative greet me with a personalized hello when I log on?

Q: How does an IT manager know when he's got it right?

A: There are no guarantees, but you could survey customers, observe prototypical customers, set up virtual focus groups to test your design. Log yourself into a competitor's Web site and see the impediments in the way of the service goal. Then use those lessons in your design. ■

KEVIN FOGARTY/BRICKS AND CLICKS

Is CRM a Faint Hope?

I'VE HEARD IT SAID that a man dying of thirst in a desert will crawl toward a mirage, even if he knows it's not real, in the faint hope of finding water.

Hey, at least it gives him direction.

Faint hope seems like a weak motivator, but when the economy tanks, you take what you can get.

That's why supposedly revenue-enhancing customer relationship management projects appear to be this year's most popular technological boondoggle.

Depending on whose estimates you believe, U.S.-based companies will spend between \$10 billion and \$20 billion on CRM software this year. Of those projects, Meta Group estimates that between 55% and 75% will fail to meet their objectives — faint hope indeed.

Cutter Consortium appears more optimistic at first. It says 40% of 159 companies surveyed said they're "satisfied" or "extremely satisfied" with their CRM systems. And another 37% are "mildly satisfied." That's damning

with faint praise if I ever heard it. After spending two years and millions of dollars on any system, I, for one, would expect to be more than just mildly satisfied.

It's not that CRM can't deliver the goods. The positive stories coming out of all that research show that, done right, CRM can be really effective at keeping existing customers on board. And a survey from eMarketer Inc. estimates that reducing customer attrition by just 5% can boost a company's revenue 25%.

The biggest problem seems to be that CRM goals are rarely defined precisely enough that the people building the system can fulfill them, according to Evelyn Follett, CIO of RadioShack Corp.

Without agreement among IT and business groups, even a vigorous, well-funded CRM rollout will fail, because the people who are supposed to be using it won't be, says Paul Greenberg, author of *CRM at the Speed of Light* (Osborne, 2001).

With CRM, which can have more practical and demonstrable benefits than that other boondoggle, ERP, the key is to decide ahead of time what you want to accomplish — not grandiose goals, but specific, achievable goals, with a fast, definable payback.

You can say the same thing about every other project, too, of course. But the beauty of other enterprise applications is that it's incredibly easy to get deep into the implementation

without really deciding what you're doing with it.

But if you get to the implementation without finishing the upfront work, Follett says, you're finished. Focus on the concrete. Don't treat every customer the same, or you'll be wasting time with your least profitable customers and ignoring the cash cows, Follett says. Focus on the best customers first.

Don't focus only on point-of-sale support.

If you don't keep customers happy later on, you blow away the whole retention part of the equation, according to Cora Carmody, CIO of automation controls vendor Invensys Software Systems.

With small, targeted pilots focused on defined goals, you can show your end users that the system is credible and that it can do what you said it can. Then you can start to expand it. That way, even if that glimmer is a mirage, at least you'll have a place to start in figuring where to go next. ■



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Web Still Faces Some Geographic Challenges

BY MARK HALL

To Alan Anderson, it doesn't matter where his managed service provider's data center is

located. In the virtual world of the Internet, the geography of computing isn't important, according to Anderson, wide-

area network (WAN) administrator at Fresh America Corp., a \$600 million food distributor based in Dallas.

The Internet has made it possible for almost any company to outsource everything from sophisticated managed IT services to SAP and more, without regard to the physical location of a company's data

center. But when IT tries to roll out its own services for global use, whether they're supply chain extranets or internal Web-based software, geography is a serious issue to consider from the beginning. Performance, security, staffing and management issues are geographically dependent and can make or break the deployment of online technology and services.

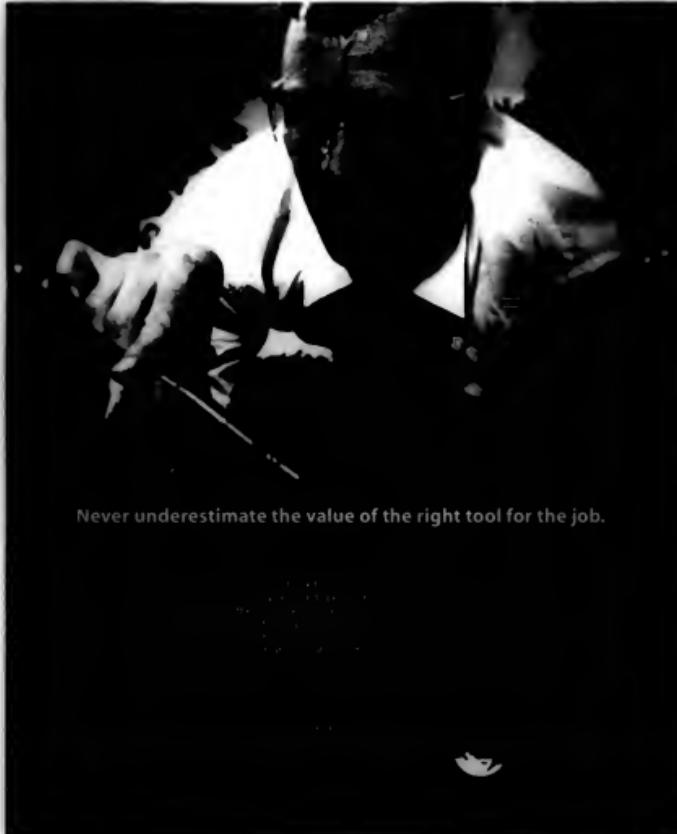
Anderson said Fresh America hasn't had any problems with the frame-relay, IP and IPX routing services that Net-Solver Inc. provides from its data center in Austin, Texas. However, at times, he has needed someone to be at one of the 10 nationwide locations of Fresh America's WAN, he noted.

The primary performance bottleneck in Web-based applications is in the "first mile," between the Web host and the Internet, which requires significant bandwidth to accommodate centralized requests. In addition to first-mile slowdowns, if all requests can be served only centrally, HTTP requests to a central server must travel across various Internet provider backbones. That increases the potential of packet loss, further degrading performance because lost packets need to be retransmitted.

Such concerns are why earlier this year, The Motley Fool Inc. in Alexandria, Va., began subscribing to Akamai Technologies Inc.'s edge services as its user base doubled to 2.9 million worldwide. Cambridge, Mass.-based Akamai's servers are at more than 650 Internet provider locations in 56 countries. Akamai will store user content in all of those servers and will serve content locally.

Simon Angus, senior product manager at Cable & Wireless PLC in London, cited the importance of having network managers ensure that parts and labor will be available the same day they're requested, which requires local coverage.

"The Web aspires to move business to low-touch or no-touch, but the reality of the marketplace tells us something else," he said. ¶



Never underestimate the value of the right tool for the job.

BUSINESSMANAGING

JUST A FEW YEARS ago, many business executives were throwing money at Internet projects like they'd just gotten religion from a TV evangelist. In these leaner, more prudent times, however, IT managers almost always have to convince top brass of the need to fund particular IT projects.

IT managers' communication skills are truly put to the test when they have to verbalize their visions to CEOs, board members and other bigwigs. "It's very easy for technologists to get enamored with the technology itself, to get into the space of 'Isn't that cool?'" says Scott Thompson, chief technology officer at Foster City, Calif.-based Visa U.S.A. Inc.

But that's a big mistake, he says. Instead, IT leaders should learn to speak the universal language of business.

"Before we invest in anything of significance, we've always had to put together a very extensive business case," says Thompson. "Not only for senior managers, but for board members and all the member banks as well. That all sounds really simple — that's something we all learn in college and business school — but it's very easy to

take your eye off that mark."

Successful communication at the board level includes the ability to tell a story in clear, nontechnical terms. It also requires a good understanding of the business needs of the company or organization.

For example, Thompson is in the midst of a strategic project called Visa Direct Exchange, which is intended to move the company's transaction processing activities to the Internet.

"Putting together the business case was just as difficult as putting together the high-level architecture," he says. It required close cooperation between the technical and financial teams, as well as hundreds of representatives from Visa's member institutions. In this case, project approval required buy-in from about 50 executives at Visa and at member banks, says Thompson.

Building a business case requires more than just whipping up a spreadsheet, warns Thornton May, corporate futurist and chief awareness officer at Waltham, Mass.-based security and privacy consultancy Guardent Inc. and a Computerworld columnist. It also means having an ongoing conversation

with board members and senior executives about what's important to the company, where it's going and how technology can help it get there.

"Being part of senior management is like being a sought-after guest at a cocktail party," he says. "You have to be a good business conversationalist."

Charles Emery, CIO at Newark-based Blue Cross/Blue Shield of New Jersey, polished his communication skills over 30 years of teaching management and IT classes, most recently at Dowling College in Oakdale, N.Y. The most important thing Emery says he learned is to know your audience.

"There's a rude awakening when you go from internal people to the board," he says. "Internal people understand the terminology. When you get to the board — who, in our case, may be power company people, bankers, investment people — they're not necessarily into the jargon."

His advice is to drop the acronyms and to use analogies to frame discussions in more understandable terms.

Emery also suggests that upwardly mobile IT managers can hone their communication skills by joining organizations such as Rancho Santa Mar-

garita, Calif.-based public-speaking group Toastmasters International.

For some, it might be a wise move to step outside IT into another type of management position to learn different dimensions of a company's business, says Jerry Miller, CIO at Sears, Roebuck and Co. in Hoffman Estates, Ill.

"I think we're going to see [fewer] people who have a total career in IT reaching the senior levels of management," he says. "More and more, they will have to have a period of time spent in a business position — and vice versa."

But what happens if a proposed initiative is sound and there's a compelling need for it, but the communication isn't well executed? When that occurs, sometimes it's best to bring in other folks to help sell a project to the board.

Rod Massey, CIO for the city of Palo Alto, Calif., identified key stakeholders whose departments would benefit from an enterprise resource planning implementation and brought them in to help him make the case for the project. They included the city's administrative services department, the finance division, accounting and the utilities department, he says.

"We had some stakeholders in other departments that had a minor role that were also involved, such as purchasing," he adds.

If users and department managers don't understand what the business benefits of an IT project are, Massey explains, "then they're probably not in a good position to benefit from it." ■

Trombly is a freelance writer in Belchertown, Mass.

Getting buy-in from the corner office requires engaging, not just explaining. By Maria Trombly

Connecting With The

**TOP
BRASS**



...to get enamored
...a big mistake

Profit Multiples

BY SHARON McDONNELL

PROFIT MULTIPLES, one of Wall Street's tried-and-true measures of the value of a business, were tossed by the wayside during the dot-com craze. At that time, many market experts seemed to feel that any attempt to tie the merciful Internet to earthbound concepts like making a profit was as presumptuous as trying to hold back the future.

The Internet blew all the old measures to smithereens right away. It was irrational exuberance, no doubt about it," says Charles Hill, director of research at First Call/Thomson Financial, a Boston-based financial research firm. "The problem was that many dot-coms were selling at 40- to 100-times revenues, which was unprecedented. IBM in the 1960s was selling at only six-times revenues."

The days of valuing companies based on potential and starry-eyed hope have ended with a resounding thud. Profit margins and earnings really do matter after all, according to the new wisdom, and as a result, business valuations based on those solid fundamentals are back in vogue.

Now that the Nasdaq composite index has lost more than half its value since it topped 5,000 in March 2000, technology company valuations by venture capitalists, public markets and companies willing to partner with or acquire dot-coms are either more realistic or obscenely low, depending on your point of view.

"The profit multiples concept was more or less irrelevant with dot-coms. Since tech companies often were not making profits, they seemed to

[Continued on page 55]

be immune from normal pricing mechanisms," says Jay Rand, a partner in the New York office of Morrison & Foerster LLP, a San Francisco-based law firm that represents emerging technology firms and the venture capital firms that invest in them.

"But now valuations for tech

companies are falling closer in line with other industries, including traditional brick-and-mortars," he explains. "Some VCs are pricing companies as little as one-times last year's revenues."

Back to Earth

Wall Street analysts and others turned away from using old reliables like profit multiples and price-to-earnings (P/E) ratios — the price of a share of a company's public stock divided by the company's earnings per share for the past year. Instead, during the past few years, dot-com firms that went public were valued using metrics such as revenue multiples, price-to-revenue ratios (the share price divided by revenue per share), revenue growth rates and market share.

All of these metrics conveniently ignored the huge expenses that those companies were incurring — particularly spending on marketing for customer acquisition, since audiences had to be created from scratch — and their actual per-

DEFINITION

Profit multiples are among the most widely used means of valuing businesses. Profit multiples are calculated using a firm's operating profits and a market multiplier, which is an analysis of the sales of comparable firms in the same industry.

formance, even if they had been in business for a few years. These potential-based, future-facing metrics helped widen the disconnect between earnings, which are ultimately performance-based, and share prices.

Meanwhile, thanks in large

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CHARLES HILL,
DIRECTOR OF RESEARCH,
FIRST CALL/THOMSON FINANCIAL



part to a sped-up business cycle, many dot-coms and technology start-ups went public and were rewarded with multi-million-dollar valuations in just 12 to 18 months instead of the many years of appreciation normally required for companies to see such a run-up in their stock prices.

"If [the number of] customers paying for your service doubled, that was attractive, but it didn't mean your business model worked. Market share — if a company was taking out a preemptive position — was seen as very important," explains Edwin Goodman, a partner at Milestone Venture Partners, a New York-based venture capital firm specializing in early-stage financing for emerging technology firms.

A shining precedent for highlighting dot-coms and those who loved them was the cable industry, whose pioneers were loss leaders that paved the way to great profits.

"Cable, in the beginning, never made money, but the theory was — and it proved correct — that if it connected to enough people, it would prosper," says Goodman.

Making Comparisons

Using benchmarks traditionally applied to mature industries like industrial manufacturing and clothing retailing to evaluate firms in emerging in-

dustries is unfair, contends Michael Röhlck, a partner at ComVentures, a Palo Alto, Calif.-based venture capital firm that invests in emerging technology firms. Profit multiples are an "excessively conservative" valuation measure, he says, because "presumably, no fresh company has profit from Day 1, even Microsoft or Intel didn't profit for two to three years."

"When you look at the early life cycle of a trend or sector — for example, the PC or Internet — you ask if there is a market. People look at revenue multiples as a testament of how big a player in the market you are," explains Röhlck. "After the sector grows and matures, then people look at who gets the best return on dollars and who figures out the best business model to seize this market. If a company has a 30% profit margin compared to a company with a 90% margin, the latter obviously has a better business model."

Before the New Economy compass changed direction, "the general rule of thumb was that your profit multiple should equal your average percentage of growth," Rand says. But with growth slowing, investors are much more concerned with the P/E ratio. A major challenge now for firms seeking venture financing is getting their management teams to understand they are simply not going to get the valuations they would have gotten one year ago. ■

McDonnell is a freelance writer in Brooklyn, N.Y. Contact her at sharonfm@compuserve.com

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BUSINESSADVICE

JOE AUER/DRIVING THE DEAL

Two Truths Behind Securing Better Deals

OVER THE COURSE OF 37 YEARS in the business of technology deal-making, I've learned a lot about the people and 10 truths that play a part in every negotiation. Two truths, which I detail here, are useful anytime but critical in an economy that's undergoing a "correction." Now more than ever, with pressures from the CEO's office to be very careful about — or even cut — IT spending, we need to focus on doing better deals and managing deals better.

One truth is that you have to hear some "no's." In other words, you may have some deadlocks and impasses in your contract negotiations. This should not be a surprise; given the contrasting goals of a vendor, who wants to maximize revenue, and you, the customer, who is dedicated to minimizing costs, especially in a down economy.

Here's an interesting scenario: A vendor makes you an offer, "\$1 million." You respond, "Not a chance more than \$900,000." The vendor says, "Done deal!" How good is the deal you got? With a response as quick as that, you've obviously left some substantial bottom-

line dollars on the table. Based on the conflicting financial objectives between client and vendor, you must be assertive enough on these issues to hear some "no's" — and not just one. That means you have to go beyond "vendor acceptability" several times to find where it really is. You have to ask for what you want — assertively. That's not easy, because almost no one likes conflict; we'd all rather just do the deal. That may be fine for some deals, but not for better ones. To get better deals, understand that you don't get what you don't ask for. So, be convincing when you say, "Excuse me. Unless

we have this and this and this, we can't do business."

Another truth is one that is seen to be frequently overlooked or, at best, given minimal attention. That is: Contract remedies are essential. If the vendor doesn't face any consequences if it doesn't produce specified results, the contract probably won't have the paper it's written on. Sometimes the vendor will live up to its responsibilities, even without stringent remedies in place. But in most cases, remedies are the catalyst to a good deal.

There are different theories on remedies, two of which I disagree with. Some people

believe remedies should exist to punish the nonperformer. And, some believe remedies should exist to compensate the side that has suffered the loss of performance.

Both theories are wrong. Remedies — which vendors don't like — should motivate them to perform, not punish them. I'm not talking about cases where you pay extra for something the vendor should have done. Remedies should be designed to spur the vendor in case it doesn't live up to the terms of the contract.

My favorite question to a vendor when negotiating remedies is: "How much confidence do you have in your ability to perform?" Most vendors answer, "100%." My response: "Good."

Then you'll have on problem with these remedies. If you're worried about the remedies, I'd be concerned that you can't do the job." Remedies are evidence of the vendor's confidence in its ability to perform.

Remedies also should have

three tiers. The bottom tier should be **problem-solving** remedies. This level would include things like having to add more people, bringing in different equipment or bringing the two companies' CIOs together. The next level, **money-giving** remedies, might involve the customer receiving liquidated damages (money) based on a predetermined performance guarantee. The third level is what we call **global thermoscholar war** remedies. This is where you talk about getting out of the deal and getting your money back.

If you don't have remedies in a contract and you suffer as the result of a vendor's lack of performance, what are your alternatives? You can go to court, or you can begin arbitration or mediation. None are good. They're costly and time-consuming — and there's no guarantee that you'll win.

If you focus on these two truths — and the other eight I'll discuss in future columns — you'll better deals than 99% of all companies. ♦



JOE AUER is president of International Computer Negotiations Inc. (www.dibatronics.com), a company that provides consultancy services on high-tech procurement. ICN sponsors CAUCUS, the Annual Conference on High-Tech Acquisition Practices.

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BRIEFS

Study: Few Users Take Advantage of WAP

A study released late last month by Stamford, Conn.-based Metia Group Inc. indicates that 80% to 90% of corporate users who bought cell phones that support the Wireless Application Protocol (WAP) use them only for voice calls, not data.

Most users said value-added services such as access to financial transactions and travel services were too slow and too difficult to use. The survey results also showed that 60% to 70% of corporate users in Europe — long considered a stronghold of data-enabled phone

use — were also using the phones only for voice, according to Metia Group.

Children's Hospital Outsources IT to CSC

Children's Hospital Los Angeles (CHLA) announced that it has signed a seven-year, \$100 million IT contract with Computer Sciences Corp. (CSC) in El Segundo, Calif.

The agreement calls for CSC to manage CHLA's business and clinical information systems, including mainframes and midrange computers, 1,800 desktop computers, help desk operations and application development.

Eight IT workers at CHLA will transfer to CSC.

Seattle Bank Names New CIO

Seattle-based Washington Mutual Inc. announced that it has named Jeremy V. Green as its new CIO in charge of directing corporate technology strategy. Green previously worked at Sydney, Australia-based Westpac Banking Corp., where he was group executive of technology, operations and e-commerce.

Online Advertising Predicted to Grow

New York-based online traffic analysis company Advertiser Inc. has released a report predicting that com-

pany advertising will grow to \$7.6 billion by the end of this year, up 7% from last year. According to the study, online ads account for 10% of consumers' daily media exposure but only 2.9% of media dollars. Advertiser also reported that 60% of online ads are direct-response-oriented but that only .05% of banner ads get clicked.

Survey: U.K. Users Want Online Banking

According to a survey conducted by San Mateo, Calif.-based Ascentia Inc., of more than 5,000 mobile Internet users in the U.K., about two-thirds want mobile access to their online bank accounts. Nearly half of that group also asked for wireless

access to corporate information, including internal directories, customer details and information held on their employers' networks.

Verizon Extends Southern Reach

Verizon Wireless has signed an agreement for wireless spectrum to serve 3.4 million people in South Carolina. Bedminster, N.J.-based Verizon acquired 50MHz personal communications services licenses from Carolinian PCSI LP, a subsidiary of BellSouth Corp. Verizon is the largest wireless provider to the U.S., serving 27 million subscribers and claiming that it covers 90% of the U.S. population. Terms of the deal weren't disclosed.



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TECHNOLOGY

REUSABLE PARTS

A growing number of firms, such as CitiMortgage and CSE Insurance, are embracing a development method called Web services that allows applications to swap functionality over the Web. • 60

SECURITY JOURNAL

When a federal agent arrives with a subpoena that implicates an employee at security manager Mathias Thurman's company in a hacker attack, Mathias puts on his detective hat to identify the suspect. But is he a hacker or a dupe? • 62

FUTURE WATCH

Finding patterns in the death of cells, stock performance and any other time-series data has been difficult using conventional data mining tools. But software now in development called TimeFinder has a visual interface that will let users manipulate simple graphical tools to query huge databases. • 64

MANAGING WEB GROWTH

Online auctioneer eBay has lessons to share about designing a Web site that must accommodate tremendous growth in a short amount of time. eBay's advice: Plan ahead, manage user expectations and keep the design simple. • 66



FEWER SERVERS, BETTER SERVICE

DURING THE PAST DECADE, IT largely migrated to client/server computing, putting many small servers at distributed sites. Now the trend is toward consolidation, with hundreds or thousands of distributed servers being replaced by fewer but more powerful multiprocessor servers at centralized locations. The payoff in overall efficiency can be big when server consolidation projects are well executed. But the downside is that there's almost no room for error in critical areas such as network scalability, security and availability.

66

BRIEFS

HP, IONA Servers Tie In Sonic Middleware

Sonic Software Corp., in Bedford, Mass., last week announced that Version 3.5 of its message-passing middleware will be integrated into application servers built by Hewlett-Packard Co. and Dublin-based Iona Technologies PLC. Based on Java Messaging Service standards, Sonic MQ 3.5 also includes an application programming interface that ensures that any bus-dependent transactions are autonomous, consistent, isolated and durable through composition. Version 3.5 will be available immediately either as a separate utility or as part of HP's Message Total-Server and Iona's iPortal Application Server.

IBM Offers Access to Virtual Linux Servers

IBM has launched a program called the Linux Community Development System, under which IBM customers, business partners, independent software vendors, consultants and academics have free access to virtual Linux servers hosted on an IBM server cluster mainframe. Users who sign up for the program are assigned their own individual server to develop, test or port applications to with complete autonomy. The program is aimed at helping Linux developers build new enterprise applications, according to IBM. Users will be able to choose between a Sunfire 100, a Turbostream Inc. zSeries server or a Linxus server, and users will be offered access for 30, 60 or 90 days.

Relativity Releases CASE Converter

Relativity Technologies Inc., in Research Triangle Park, N.C., has released ResonateWare, a legacy computer-aided software engineering (CASE) language ResonateWare converts the CASE code into modern languages such as Java, C++ and Visual Basic. Pricing starts at \$25,000 per user.

TECHNOLOGY

Web Services Offer Flexibility, Savings

But architectural hurdles lead to slow adoption of development method

BY LES COPLAND BLAIRDIN

AGROWING NUMBER of firms, such as Citimortgage Inc. and CSE Insurance Group, are embracing a development method called Web services that allows applications to swap functionality over the Web. It's a way to use the functional bits that power applications more efficiently, but many users say they have just begun the tough architectural work that Web services require.

Building Web services, a trend which has gotten a boost from proponents Microsoft Corp. and Sun Microsystems Inc., allows the components of one application to be used by other applications in different locations via the Web and a set of underlying protocols, such as Simple Object Access Proto-

col (SOAP) and XML. Web services can reduce the cost of building new applications and shorten the time it takes to get them in production.

"Right now, it's like having a different hammer for every nail," said Andy Zimmerman, senior systems architect at Citimortgage, a division of SU2 billion financial services company Citigroup Inc. in New York. Some applications could possibly use the same components, but the underlying architecture of most aren't set up to share that type of functionality, he said. Citimortgage is developing Java-based Web services to reuse its components, instead of rebuilding the component for each new application that requires that functionality.

"If we've got a component-based application, and market

conditions demand that we change it, it's easier to change a component than the whole thing," Zimmerman said.

For example, instead of building a credit card authorization utility for each application that requires one, Citimortgage would place that component on an application server, enabling different applications to access it as a Web service.

To put that Web services plan in place, Citimortgage is piloting component management software from Cleve-

land-based Flashline.com Inc. "The bank's components are expected to quadruple by year's end, so tracking them is important," Zimmerman said.

San Francisco-based CSE Insurance recently built a Web service in the form of an insurance policy quote engine. The component sits on a Web server and is available to a number of internal applications, said David Brinker, CIO of CSE Insurance. The application was built in Visual Basic, using tools from San Francisco-based Avinon Inc.

The quote engine provides real-time rate information to CSE field agents and could be put to use in other external applications. "Because we've already built it, we can readily attach other Web services," Brinker added. ▶

Berkeley Developing Worldwide Storage System

BY LUCAS MEARNS

The University of California at Berkeley is looking to create a data storage network that encompasses the planet.

OceanStore is a research project at the university that would use software to break data into many tiny, encrypted parts and store them across a vast array of Web servers owned by Internet service providers around the world.

A vast redundant storage network, such as OceanStore, would allow easy access to data from anywhere and unprecedented levels of disaster recovery, according to its in-

ventor, John Kubiatowicz. If more than one computer or server were to crash, OceanStore would be able to rebuild the information using pieces stored in multiple clusters of other servers.

OceanStore would track documents by assigning each one a globally unique identification (GUID) tag before it's split into fragments and sent over the Internet to be stored randomly throughout the network.

"You would maybe spread 64 fragments of a document around, and maybe 16 of those can be used to reconstruct (the

original document)," Kubiatowicz said. "We're assuming a system the scale of OceanStore will have pieces of it broken all the time."

For example, to retrieve a choiced-up 1989 tax return, OceanStore would send intelligent agents onto the Internet looking for a GUID tag before it's split into fragments and sent over the Internet to be stored randomly throughout the network.

More frequently used data would be stored on nearby servers to cut down on latency.

Consumers who want to save their documents on OceanStore would pay a monthly fee to an Internet service provider, which would then arrange to redundantly store the data on another Internet provider's

server for a small fee.

Neal Goldman, a research analyst at The Yankee Group in Boston, said there are inherent problems associated with OceanStore. For example, enterprises probably wouldn't store mission-critical data on a Web-based system.

"You don't know what the bandwidth is between you and the piece of data you want, so there are some real issues as far as performance," Goldman said.

The project has received about \$500,000 in seed funding from vendors including IBM, Nortel Networks Corp. in Brampton, Ontario, EMC Corp. in Hopkinton, Mass., and federal agencies such as the National Science Foundation and the Defense Advanced Research Projects Agency, both in Arlington, Va. Kubiatowicz said. ▶

SOAP

Allows the remote procedures calls of Web services to carry past firewalls by using HTTP as its transport mechanism.

XML

Describes the data that gets transmitted in the Web services to applications on the receiving end.



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What to Do When the Feds Come Knocking

A federal agent tracks a hacking attack back to Mathias' firm. Could an employee be the perpetrator?

BY MATHIAS THURMAN

INTRUPT MODE: You've gotta love it. My day was going just fine, and I was even thinking of leaving early and driving down to the beach for the afternoon when I got this call from the receptionist that a man from a law enforcement agency wished to see me.

I made my way to the front desk, where a man dressed in a dark-gray suit and red tie was等候 to greet me. He said that he was an agent from the high-tech squad and that he was investigating an incident involving unauthorized access to a financial institution.

The agent flashed his badge and credentials. Sure enough, he was from one of those three-letter government agencies. I escorted him to a small conference room, where he showed me a subpoena and a search warrant for information regarding the security incident.

He seemed to trust me and was probably even taking a chance that I wasn't the bad guy or in cahoots with someone. If you can't trust the corporate security manager, who can you trust? Before proceeding, however, I made a call to my company's general counsel, with whom I have a pretty good relationship. I explained the situation to him, and he asked if I thought I could handle the situation. I said yes, and the counsel told me to go ahead and let him know if he needed to be involved.

The Allegation

The agent went on to briefly explain that on April 4, a computer with a certain IP address that was traced back to a computer at my company was used

to hack into a Domain Name System (DNS) server within a small financial institution in the Southeast.

The perpetrator broke into the DNS server and gained access to an Oracle database that housed credit cards. I guess the financial institution didn't set up the server trust relationships very well. Most administrators know that DNS servers should never be on the same network or have a trust relationship with critical infrastructure.

At about 10 p.m. on April 4, the agent had gained root-level access to the institution's DNS server and from there logged in to the Oracle database, where he created an archive of thousands of credit cards and transferred them to another server using file transfer protocol. The agent wouldn't give me any details regarding the hacked system; that investigation was being handled by a field office in the Southeast. But I found out later that the server the hacker used to transfer the files was a hacked university system in the Midwest.

The agent needed to get information on the computer at my company that the hacker had used. From what I understand, the subpoena is used for "subscriber," or employee, information, and the warrant is for the actual system or any logs related to the incident, which the agent could confiscate if necessary. Dealing with these legal documents isn't new to me. In a previous job, I serviced many law enforcement requests.

Anyway, I recognized the IP address as one of 28 that we use to allow dial-up Internet access to our network for salespeople, consultants and other employees on the road. We don't do any

address translation, and we just assign a small number of publicly accessible addresses for this function.

I explained our dial-up access situation to the agent. I would have to query our RADUIS server to determine who was assigned the suspected IP address on the date in question. We went to the server room, where I logged in to the RADUIS server and made a query for all connections between 9 and 11 a.m. on April 4. Only one user name came up: jbarri.

The Suspect

James Harris (not his real name) is on the inside sales team at my company. I know this guy, and I know that there's no way he could have possibly hacked into anything. James is a competent salesman, but his technical knowledge doesn't extend beyond e-mail, Web browsing and AOL Instant Messenger. I explained all of this to the agent, but he didn't seem to care.

After some discussion, I made a copy of the RADUIS logs and disabled the jbarri account on the RADUIS server until we could resolve the issue. I would have liked to leave the account active in order to catch the perpetrator, but company policy dictates otherwise.

I then called our general counsel and briefed him on the aspects of this incident. He suggested that we contact James' supervisor first. I scheduled a meeting with him at 2 p.m. and went to lunch with the fed.

When we spoke with James' supervisor, Greg, things began to make sense. James' laptop was stolen from his car two weeks ago. A police report had been filed, but the laptop was never recovered and the replacement laptop wasn't in yet.

James' only access to the Internet is from his desktop computer, which has a direct Internet connection but no dial-up access. Still, the agent wanted to talk to James. It was possible, he said, that James might be accessing the dial-up account from his home PC.

At 3 p.m., James, Greg, the agent and I gathered in the conference room. The

THIS WEEK'S GLOSSARY

RADIUS: The Remote Authentication Dial-in User Service, created by Murray Hill, N.J.-based Lucent Technologies Inc., is considered by many to be the de facto standard for dial-up authentication, authorization and accounting. We use a RADIUS server to authenticate and log dial-up access to our infrastructure.

LINKS:

www.lawfirms.com/RADUIS.html: Everything you ever wanted to know about RADIUS can be gleaned from this Web site.

<http://FloridaLawFirms.com/privacy.html>: Visit the Web site for details of the Electronic Communications Privacy Act. In order for a federal law enforcement agency to monitor private communications, it normally must complete certain requirements in what's commonly referred to as a Title 3 wiretap order. The act gives the agency the legal authority to tap telephone lines and Internet connections to information pertinent to a crime.

agent introduced himself, pulled out his badge and then asked Greg and me to leave the room. James was in there for at least an hour and a half, after which the agent was only somewhat convinced that someone was using James' stolen laptop to access the Internet.

Apparently, James configured his laptop to remember his password (a wonderful Windows feature), so the thief could dial in to our network without knowing the log-in and password. The agent then pulled me aside and discussed the option of installing a wiretap to trace back the phone connection if the perpetrator tried using the stolen account to gain access. I told him that I would need to discuss the matter with my general counsel.

So, now I've got a bunch of work to do and decisions to make. I'll keep you updated as this thing shakes out. ▶

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Software For the 4th Dimension

Visual interface lets users easily query time-ordered data. By Sami Lais

WHAT DO THE death of a fruit fly cell and the rise and fall of a stock's price have in common?

Both things happen incrementally over time, says Harry Hochheiser, a computer science graduate research assistant at the University of Maryland in College Park.

Using conventional data

mining tools, finding patterns of cell death and stock performance or any other time-series data has been difficult.

Hochheiser's TimeFinder software has a visual interface that lets users manipulate simple graphical tools to query huge databases and then lets them see the results represented on a graph.

One mouse click replaces the typing of multiple parameters, reducing procedure time and the chance of introducing errors.

A user clicks the mouse to draw a box on an empty graph with defined axes, say, with time on the X axis and stock price on the Y. Thus, the user

poses a query, such as, "Show me all stocks with prices between \$50 and \$75 at the end of last September." A second window then shows a list of each stock that meets that criterion.

By drawing more boxes, a user can refine his query so only gets stocks whose prices then rose 50% by January and fell by 25% by March.

Andrew Woelflein, a London-based financial analyst,

recently saw the software demonstrated. "This is great," he says. "With this, I could query the data directly."

Right now, this is the kind of query you submit to the analysts, and they get back to you in maybe a day. You change the parameters, then it's another day. With this, I could get the answer immediately."

To build TimeFinder, Hochheiser used Java, an open-source software development kit that was built on the Java 2D application programming interface and created at the university's Human-Computer Interaction Lab.

"Harry's work is a great example of the improved visual

interface that lets a novice perform at the level of an expert," says Hochheiser's adviser, Ben Shneiderman, the laboratory's founding director and a leader in visual interface design.

Working with Shneiderman, Hochheiser is still developing TimeFinder. He demonstrates a feature he's recently added to the software that lets users superimpose results for comparison. The lines representing performance of most of the stocks follow a similar path. One peak stands out much higher than the others.

Presenting the information visually allows for serendipity," Hochheiser says. He points out the spike — with conventional data mining tools, there would be no way you'd know about this stock. But now that you know about it, he says, you can ask, "What's different about this one that caused this performance anomaly?"

At SmartMoney.com in New York, Martin Wattenberg, director of research and development, is developing similar software for use on the company's Web site.

Wattenberg says he first watched "how people use the existing query tools. They'd type in the criteria, generate the price graph and immedi-

ately look at the price graph."

"I thought, if the graph is what they're interested in, then this works backwards," he says. "So I looked to see how I could eliminate the drudgework of entering the criteria and let people go directly to the graph."

On a blank graph, users of Wattenberg's software do a freehand sketch of a performance curve they seek. The drawing represents a query, which returns stocks whose performance curve matches the sketch.

"Harry's software is a much more sophisticated tool for searching in a more complex way," Wattenberg says. "Ours is aimed at the novice user, letting them quickly find stocks that match a target graph."

Although Hochheiser uses stock prices to demonstrate TimeFinder, the software began with a search by Eric Bachrecke, an assistant professor at the University of Maryland's Center for Agricultural Biotechnology, for a way to interpret data in cell death.

"The type of data we collect is not very different from temporal stock data," Bachrecke says. "Only for us, it's how genes get turned on and off over time; gene expression."

Bachrecke conducts DNA

microarray experiments using fruit flies, which have approximately 14,000 genes. The amount of data recorded from the experiments is vast.

"Our brains are not capable of looking at it and making sense of it. We need tools like Harry's software," Bachrecke says. "Other people have development tools to look at this, but they're not as good as they should be."

First, Bachrecke identifies patterns of gene expression in normal cells, then in mutant cells. "Then we overlay the data and compare the two," he explains.

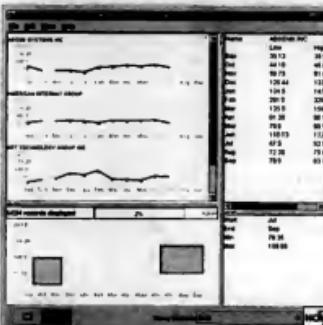
"That's the beauty of data visualization," Wattenberg says. "You nail your method in one discipline, but you immediately have something that will work in another."

Hochheiser's work has been partly funded by a grant from America Online Inc. "But we are actively seeking partners for further development," Shneiderman says.

"I mean, we've talked about biological research and stocks, but the generalization doesn't have to be time-related data. It can be any linear-ordered data. It's equally applicable to something off-the-wall like oil well log analysis," Shneiderman says. "We're pretty excited about Harry's work." ▀



HOCHEISER: Presentation of time-series data allows for "serendipity."



TIMEFINDER'S graphical interface makes it easier for users to compare time-factor data, such as in the stock performance charts above.

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THINK BIG. That may be the image ingrained in our imaginations, but it's not always accurate when it comes to managing IT resources.

One big idea currently percolating at Dresdner Bank AG focuses on thinking small. The Frankfurt-based bank is in the process of paring down the approximately 5000 servers it maintains throughout Europe.

Depending on what's running at an individual branch, network administrators must manage a wide variety of server platforms, including IBM, Hewlett-Packard Co. and Sun Microsystems Inc. hardware running each vendor's flavor of Unix or Windows 2000. This IT potpourri evolved as the headquarters and branches added bits and pieces during the past decade, according to Anthony Wilbert, systems manager at Dresdner's IT services arm. "It's cheaper to have one big machine than hundreds of small machines," he says.

The bank's consolidation project began a year ago and will continue indefinitely. So far, the main result has been the installation of a Sun Enterprise 10000 server at headquarters. The bank's goal is to reduce its total number of servers, but Wilbert acknowledges that some branches will continue to run local applications on local servers.

Better IT... With Reservations

Another "think small" advocate is Wyndham International Inc. in Dallas. The global hotel chain is putting the application that controls guest arrivals, departures and billing onto two IBM



A BIG ISSUE is being able to see the impact a resource crash has on the business and other resources, says Anthony Wilbert, systems manager at Dresdner Bank AG.

**FEWER SERVERS
BETTER
SERVICE**

TECHNOLOGYFIELD REPORT

As IT shops replace many small servers with fewer bigger ones, lessons emerge for those who believe less is more. By Alan Joch

cServer p680 computers running Unix. The same guest-management tasks used to require 165 servers scattered across 100 locations.

The Web helped push Wyndham to re-evaluate the role that today's megaboxes play in a wide-ranging enterprise. A few years ago, the hotel chain picked Opera, a thin-client application from Columbia, Md.-based Microsys Systems Inc., as its guest-management system because the program allowed IT managers to upgrade and tune the program at all of its front desks from a central administrative center in Dallas. "We then wondered, 'if that's good at the workstation level, too,'" recalls Gary Owen, vice president of IT operations.

Although companies expect to save costs through server consolidation, Wyndham estimates it will lower its hardware bills by as much as 40% in the coming year – learning to live with less cores than with stumbling blocks. Managing fewer servers may be easier, but when things go wrong, a company suffers, not just the workers at a single network node. Likewise, network scalability, security and availability become so critical to a firm's success that there's almost no room for error.

Wyndham and Dresdner Bank aren't the only large companies pruning the tentacles of their client/server networks. Ten years ago, the placement of servers everywhere and anywhere was considered the best way to achieve

high performance and computing availability. Nowadays, corporations are taking advantage of better networking gear, lower costs for high-end components like switches and administrative tools that manage a small number of servers in central locations.

Server consolidation doesn't necessarily mean that large enterprises are less hungry for hardware, only that their tastes are changing. The worldwide server market continues to grow, even as other high-end sectors have been bottoming out. Sales last year ended on a 14% upswing in the fourth quarter, with more than \$16 billion for the period, according to Framingham, Mass.-based market research firm IDC. The biggest growth was in consolidation-friendly, rack-mounted servers, whose sales rose 25% last year.

Companies start down the consolidation trail to reduce costs. Besides lower hardware costs, Wyndham expects to save "several hundred percent" over five years in reduced travel and training costs, according to a Wyndham spokesman.

Consolidation can also make networks more manageable. Programs like HP's venerable OpenView, Computer Associates International Inc.'s Unicenter TNG or Tivoli Systems Inc.'s TM give administrators centralized control panels to keep servers and networks running at optimal speeds by monitoring performance and, in some cases, reallocating resources to break through bottlenecks.

Reducing the number of servers that a company runs also helps minimize the demand for scarce IT expertise. Instead of needing multiple systems managers, companies can operate with a handful of administrators at IT headquarters. New generations of networking hardware and services have created price/performance advantages that make consolidation possible.

"We now see sophisticated technologies like symmetric multiprocessing, even in very inexpensive servers," says Jonathan Eunice, principal analyst in the server technologies group at Illuminata Inc., a technology research firm in Nashua, N.H. "The result is excellent performance in a two-way server for about \$2,000, or a fully configured eight-way server for under \$100,000. This makes it technically appealing to do a consolidation."

He adds that a new mind-set is tak-

ing over server management techniques. Rather than buying high-end computing power packed into towers, large companies are putting together servers that fill a central data center much like the telecommunications gear that hangs in communications closets. "By consolidating 50 one-processor servers into new-generation server racks, companies save not just on equipment costs but on the costs of power, management and maintenance contracts," Eunice says.

Finding a Balance

Although large companies are finding that server consolidation offers hope for lower costs and easier systems maintenance, IT experts caution against blindly tearing out the old and plugging in the new.

First, a company considering consolidation should look for a balance between a widely distributed and consolidated approach. "Either can be right. There's never a simple solution," says Mark Hudson, a senior consultant for HP's 9000 servers. Consolidation efforts should be driven by individual applications, he adds.

"There will be areas where a distributed environment makes sense, especially when a specialized application is needed locally," says Hudson. "Also, many companies work in a multisite environment. The database and applications may be centralized, but the access is remote. I think we'll continue to see mixed environments."

Companies with a large number of affiliated branches, such as Dresdner Bank, are often better served in a mixed environment. "Even today, a central data center is probably not good enough for say, 800 offices," says Eunice. "You may really need a server in each branch. Here, distributed makes all the sense in the world. On the other hand, if you're dealing with a large office, like an insurance company, [where] the network within a single building or campus is so reliable, so close to 100% available, [then] you don't really need servers on every floor, and you can have a single data center."

Companies can also take advantage of less-is-more computing by consolidating at the local level. For example, a multibranch company might use centralized servers for individual campuses, buildings or floors. Savings in hard-

ware and maintenance costs will still accrue, if on a smaller scale.

"The real answer is to be centralized as the situation allows," says Eunice. "In some cases, it's better to consolidate on a building-by-building or site-by-site basis. At companies that have thousands of servers, it's valuable even if they can get down to a two-to-one or three-to-one consolidation."

The crucial consideration, no matter how widely a company embraces consolidation, is system reliability. If all the computing resources are put in one basket, managers must watch that basket closely.

"Really understand what service levels you want to provide," Hudson says. "Upfront design is critical. Ask yourself what scalability will you need, how much headroom should you build into the system? Have you built in enough redundancy? Downtime is a huge no-no. If that server goes down, it's not just a local issue when your system is centralized."

Teeling Up for Scaling Up

Finally, before you decide on what software management tools to trust with your enterprise, run some on-site tests to make sure your administrators are comfortable with the interfaces and with the kind of information the programs provide.

To keep an experienced eye on the health of this system, Wyndham's Dallas IT staff uses Tivoli TM to monitor networking equipment and software. To keep close tabs on its network resources, Dresdner uses HP's OpenView for network control, Micromouse Inc.'s Netcool to monitor uptime and Tivoli's Business Systems Manager for application availability. "The Tivoli product helps us manage the enterprise," says Wilber. "The network administrator can work on one machine. A very big issue is being able to see the impact a resource crash has on the business and on other resources."

By taking a measured approach that considers consolidation against the need for greater system reliability, large companies can save on hardware costs, maintenance headaches and administrative resources. In short, less can indeed be more when it comes to managing large-scale enterprises. ▶

Joch is a freelance writer in Frisco, Texas. N.H. Reach him at ajoch@monad.net.

It's cheaper to have one big machine than hundreds of small machines.

ANTHONY WILBERT,
SYSTEMS MANAGER,
DRESDNER BANK'S IT SERVICES ARM

As its online auction site has grown, eBay has learned to manage user expectations, keep design simple; and always plan ahead. By Mathew Schwartz

ONLINE AUCTION site eBay is big. Very big. "We have over 24 million users right now," says Laura Burns, senior usability engineer at San Jose-based eBay Inc., "and over 6 million items for sale." Every day, eBay serves its users 100 million unique page views. "The site is huge and has just grown tremendously," says Burns.

But sites of eBay's size and growth rate always have special usability concerns, says Kipp Lynch, director of user experience at NerveWire Inc., a management consulting and systems integration firm in Newton, Mass. "You've got this huge amount of data, and there are usually two ways to get at it: search and browse," Lynch says. eBay does search "reasonably well," he says. But when it comes to browsing, taxonomy (deciding which items go into which categories) is tricky.

"Taxonomies are really difficult," says Lynch. "Everyone is always struggling with it; no one has gotten it right." Other large sites such as Sunway, Calif.-based Yahoo Inc. face similar problems, he says. eBay struggles with its fast growth, constantly

turning to users to gauge new designs and taxonomies. The company also tries to keep its Web site design as simple as possible so users can find what they're looking for quickly.

As eBay grows, new categories are sometimes added to more accurately classify the 6 million items on the site being offered in auctions.

"The user interface that worked three or four years ago doesn't necessarily work now. Who knew that when we were designing a site with 60,000 items and a handful of categories, we'd so soon have to make it support over 6 million items and thousands of categories?" says Alex Poon, senior director of advanced technology at eBay.

Poon should know: he redesigned eBay's taxonomy in 1999. Because rapid growth can derail many designs, eBay pays extra attention to how well any new feature will scale. "For example, when we redesigned our navigation bar two years ago, we considered placing our top-level categories into the navigation bar but decided against it, knowing that we would eventually run out of space," says Poon.

All sites should plan for quick, unexpected growth spurts by doing upfront usability testing before the sites launch, says usability guru Jakob Nielsen, principal of the Nielsen Norman Group in Fremont, Calif. Because "once you get a big installed user base, you need to have very slow moves and slow changes," he says, or else hundreds of thousands of users could get lost. And at that point, no help desk would be equal to the challenge.

"There's a myth that on the Web, just because your user interface lives on a server, you can change it at any time," he says. "And that's technically true, but not from a usability perspective."

Ebay listens to users in forums and surveys and even flies in groups to meet at its offices every month. But in spite of all that research, users can still react unexpectedly. And when it comes to design, sometimes eBay has to sneak changes past users.

Take what happened in June of 1999. After a month of vetting with users, eBay launched a redesigned site. Before launch, users had praised the beta design on eBay-related message boards. But soon after its official launch, the site crashed for about a day and experienced some other intermittent problems.

The company immediately reinstated the old site design and disabled various personalization and advanced search features in order to find the problem. It turned out that the outage was caused by a glitch in the Solaris operating system powering eBay's fleet of Sun Microsystems Inc. Enterprise 10000 servers, according to public comments made at the time by Sun CEO Scott McNealy.

In an open letter of apology to users, eBay founder Pierre Omidyar said that "there was no relation between Wednesday's outage and the launch of our new site design." But eBay reinstated the old design immediately, concerned that the new design and the outage may have become synonymous in some users' minds.

The crash and outcry over the redesign made eBay retrench and move slowly. It began to roll out the updated design very, very slowly — a new page here, a navigation bar there. No one cried foul.

False impressions

Sometimes even false user perceptions must be considered in designing new features. On a homepage redesign in March of last year, eBay produced a

page that was "very colorful and looked very graphically intense," yet took less time to load than the older version, says Burns.

However, in testing the page with a few thousand users, concern arose. "We showed them an image of the page — it didn't actually work — and they said, 'This

page has so many graphics on it, it's going to take forever to load,'" says Burns. "We knew it loaded faster, but because they thought it wouldn't, we ended up paring it down a little bit."

No matter what the information architecture is,

MORE ONLINE

To learn more about how eBay profits from ongoing innovation in its site, visit www.computerworld.com/ebay.htm.

Grow Your S Keep Your U

keeping so much data easily accessible is an ongoing chore. "We don't have all the bangs and whistles of some of the sites that are out there. Because of all the users, we need to simplify what's on the site," Borns says. "One of the main things we hear from them is, 'Keep it simple.'"

"No one would say, 'Wow, [eBay] should win a design award,' but it's very simple, very usable," says Lynch. He praises the site for using such traditional navigation features as tabs and plain-text links.

"What's good is they're not trying to be clever anywhere," he says — in other words, it's not technology for technology's sake.

Take JavaScript, for example. Many sites use it to create flashy roll-over menus or drop-down boxes. But on eBay, it's used only to enhance some things, such as the "sell an item" page. "The old version is this tremendously long list of items," says Borns. In that version, users had to pick which category their item was in from a list of 4,500. Now, however, once a user picks the top-level category (for example, electronics), eBay uses JavaScript to dynamically reduce the second- and third-level choices (general audio speakers) to only categories that logically occur under the first category picked. So instead of having to scroll through 4,500 choices, users might only get 10, 20 or 50, says Borns.

But there are still a lot of categories. And although any improvement helps, eBay could perhaps approach things differently. "It's intimidating for the first-time buyer. I don't think [eBay] provides enough hand-holding," says Nielsen. "You've thrown into an interface with 5 million things."

Underscoring all of eBay's design issues, however, is the fact that its users are often collectors who will fill out any number of screens or suffer any interface to get what they want. "Collectors are a bizarre bunch. There are people who collect barbed wire," notes Lynch. And they do so fanatically. At eBay, "you've got really motivated users, and motivation can overcome a lot of usability issues," he says. ♦

Redesigning The Seller's Market

Online auction and marketplace eBay faces enormous design challenges when trying to make the buying and selling of goods and services on its sites easier. For one thing, targeting 24 million users means designing a site that both experts and neophytes can quickly use and understand. Note, however, that eBay and other third-party vendors offer special PC-based software for power sellers, or those selling so many items that managing them via a Web interface would be ineffective.

Though eBay offers online training to teach users how to sell, its sales pages must be feature-rich as well, giving clear to users about how sales are progressing and when they're completed and helping sellers close deals. The before-and-after screens below show how eBay redesigned the page that sellers can use to monitor sales. The old version combined auctions in progress with those that had ended. The new version creates a separate space for items that have been sold, allowing sellers to finish sales more easily.

Before

After

• It's unclear that users would see greater detail about each item by clicking on this link.

• Although the auction for an item has ended, this screen doesn't help sellers finalize sales. Completed sales require the seller to indicate certain actions, such as contacting the buyer and sending purchased goods.

• Though experienced users would know the term **reserve**, new users might not know that it means "reserve price."

• This section shows the status of all unsold items held within a certain time window. Users select the time frame directly above the section.

• A new section lists only those items that have sold. New features help sellers complete sales.

• Word-of-mouth feedback is the cornerstone of trust in the eBay community, and getting feedback is essential to eBay's success. So now, one click allows a seller to leave feedback about a buyer, rating ease of communication and payment speed. Sellers can exclude poorly rated buyers from their sales, and buyers can avoid bad sellers.

• Starting three days after a sale is over, sellers can generate an automated e-mail reminder to buyers that includes predicted data such as price and contact information.

• A link to a high bidder or bidders (in auctions with multiple items) lets sellers more easily contact them.

If buyers use the Billpoint online payment service, sellers can see here that payment has been received before shipping goods.

TECHNOLOGY EMERGING COMPANIES

Building the Wireless Web for Enterprises

W-Techologies helped brokerages, but can it help other firms deliver mobile services?

BY DAVID ESSER

THE BUSINESS case for wireless access comes into sharp relief when spokesman Charles Salmaso describes how his company, Quick & Reilly Inc., and its Web site have benefited from w-Trade software from w-Techologies Inc.

"We don't have a big group of our customers using this," he says. "It probably accounts for only 1% or 2% of our customers, but they account for probably 5% to 10% of our trading volume." The New York-based brokerage chose w-Trade because it integrated easily with its existing infrastructure and was flexible enough for future growth.

w-Techologies got its start in 1997 when co-founders Donna Oliva and Sergey Fradkov spun off a wireless project at New York-based UniX Inc., an IT services company. Their flagship product, w-Trade Wireless Trading System, lets brokerage customers receive quotes and trade securities on Wireless Application Protocol phones. Palm Inc.'s handhelds and pagers, w-Techologies claims that it has 30% of all brokerage firms as customers. Now it's diversifying.

After releasing its w-Bank software for banks in 1999, the vendor introduced 25 applications based on its underlying Mobilero wireless application server software, geared toward the finance, e-commerce, Web content, communications, and the enterprise markets.

Mobilero includes six applications, including for customer relationship management, logistics and help desk.

Prices start at about \$60,000 for Mobilero and a single ap-

plication supporting 50 concurrent users and can reach \$500,000 or more for the entire application suite, technical training, a development kit and distributed hosting for up to 200 users.

Mobilero's competitive ad-

vantage, says Fradkov, is its flexibility in providing enterprises with both prepackaged applications and a development tool kit for custom applications that supports thin and fat clients. Server templates allow applications to be used with a wide variety of mobile devices without the need for porting, Fradkov says.

w-Techologies is aggressively pursuing vertical mar-

kets such as manufacturing and retail. One early success story is FedEx Corp. in Memphis, which on March 12 unveiled a Mobilero-powered service that lets customers track packages and locate drop-off stations.

"w-Techologies beat several dozen competitors," explains Randall Roy, FedEx's vice president of network systems. "A good part of it was the amount of experience they had and the success they had in the business sector," he says.

Main Benefits

Cost savings from avoiding customer service calls and increased customer convenience are the main benefits, says Roy, who reports an easy four-week development cycle and no performance glitches so far. "They've been very responsible and able to do what they said they would do," he says.

Oliva says productivity and cost-savings benefits will keep wireless in many companies' buying schedules despite the economic stamp. "We have to grow the company at a pace that keeps up with demand, but we have to be a lot more careful about how we spend money," she says.

Analysts say the company has done an admirable job of just that. "They're well-positioned going forward," according to Ed Kountz, a senior analyst at TowerGroup in Needham, Mass. "They have some talented people and they have some advantage in being early in the game."

Proving w-Techologies can succeed outside the financial services sector is an important hurdle, which is why the FedEx win is so important, says Jennifer DiMarzio, an analyst at Sunbeam Strategies Inc. in Boston.

"In the last couple of years, there have been a lot of companies offering a mobile platform," she observes. "It's going to make it hard for these guys to prove their value-add."

Esser is a freelance writer in Antrim, N.H.

COMPUTERWORLD June 4, 2001

the buzz

STATE OF THE MARKET

In Search of Wireless Winners

As w-Techologies seeks to expand beyond its financial services roots, the vendor faces increased competition from companies that take a more plug-and-play approach. It's also smaller and less well-funded than most, at a time when venture capital is scarce. A shakeout is likely, and IBM is coming on strong with WebSphere Everywhere, say analysts.

Still, the vendor's experience with highly customizable software may be attractive to large companies. And the market for mobile-business services is strong. Despite the current high-tech slumps, Framingham, Mass.-based IDC predicts that the U.S. market will grow from \$201 million last year to \$2.1 billion this year.

724 Solutions Inc.

Toronto
www.724.com

724 Solutions hasn't moved much beyond its financial services niche, but general manager Alister Renne says the firm will exploit its core competency — secure mobile transactions — in its new products.

Aether Systems Inc.

Owings Mills, Md.
www.aethersystems.com

Aether Systems has a daunting task ahead, especially over w-Techologies, but it views its niche as "a full-service company to financial institutions," says John Shopey, Aether's corporate vice president of financial services.

Brience Inc.

San Francisco
www.brience.com

Chief Strategy Officer Kevan Keay Patil calls the newly released Brience 3.0 software "a pure play Internet platform that connects to your mobile systems." The company has \$200 million funding and is profitable, Patil says.

Everypath Inc.

San Jose
www.everypath.com

Everypath focuses more on providing plug-and-play software products than on development services and hosting.

—David Esser



DONNA OLIVA (left) and Sergey Fradkov say they will grow their company by keeping up with the demand for wireless products.

w-Techologies Inc.

150 Broadway, 15th Floor,
New York, NY 10038,
(212) 406-7885

Web: www.wt-technologies.com

Niche: Customizable wireless applications, development tools and services

Company officers:

- Donna Oliva, CEO and co-founder
- Sergey Fradkov, chief technology officer and co-founder

Milestones:

- April 1997: Company founded as w-Trade Inc.
- March 2000: Introduced e-commerce, content and communications applications
- September 2000: Changed name to w-Techologies Inc.

Employees:

200

Burn money:

Approximately \$50 million from Westway Capital LLC, First Union Corp., Merrill Lynch & Co., WebFargo & Co. and others

Products/pricing:

Installed systems start at \$60,000 for a basic configuration of 10 to 50 concurrent users and one application. Larger implementations may cost \$400,000 to \$600,000.

Competitors: Dryden Brokerage Services Inc., FedEx, First Union, U.S. Discount Brokerage Inc. and others

Real flags for IT:

- Most of the firm's expertise is in financial services applications
- It faces many established, larger direct competitors

TECHNOLOGYSKILLS SCOPE

Getting an Edge

With more candidates in the job pool this year, you really need to make yourself stand out from the competition. We asked two experts to name the new technologies that will impress even the fussiest hiring manager.

By Mary Brandel

EVERYONE WANTS an edge, a particular skill or experience that will shoot them into the career stratosphere. But which technologies should you concentrate on? And how do you get the training or experience in them? To find out, Computerworld spoke with executives at two recruiting firms: Tom Morgan, vice president and director of recruiting operations at Pencos Systems Inc. in New York, and Robert Beauchemin, president and CEO of CNC Global Ltd. in Toronto.

Can you forecast any new business strategies, competitive issues or economic factors that will affect technology investments, thus influencing which technologies would be best in train for?

Morgan: The business trend I see is real-time access to information, whether it's inventory, the supply chain or financial statements. Venture capitalists are still pouring a lot of money into companies that can help provide the infrastructure that makes real-time access possible — storage, network

management, optical networking, wireless applications and handheld devices.

Beauchemin: There will be continuing investment in technology, but most organizations will take a more cautious approach in terms of balancing time to market. Employers will be willing to wait another week and find a person with a 95% fit rather than a 75% fit, as in the past.

That being the case, it's important for technology workers to round out their expertise level and not be all that specialized. For instance, it's not enough to be a good programmer — you have to have creativity or adaptability to new concepts.

Which emerging technologies will be most in demand by employers in the next couple of years?

Morgan: Any technology that enables information to flow in the most expedient manner, like embedded systems technology. Some examples are a flight navigation system or a point-of-sale system or a control arm on a vehicle, where the instructions for what the system should do are embedded in the code. Data centers are becoming more important, and storage technologies

are becoming critical because of the large amounts of data. Networking and network management are also a key piece, especially optical networking, in order to increase the bandwidth and speed to carry this information. I'd also include wireless and handhelds and things like that.

Real-time access also depends on effectively and efficiently transacting over the Internet, which leads to security issues — another hot area. We're seeing more of a need for people who can write secu-

rity measures into the application code.

Beauchemin: WAP [Wireless Application Protocol] applications are hot. We also see a lot of demand for wireless LANs.

You might laugh at this, but good old project management is also in demand. There are never enough project managers, and finding good ones is always challenging.

Another technology growing in demand is electronic bill presentation and payment. Underlying technologies like XML help standardize the exchange of documentation that is involved. And there are a lot of collaborative applications. This requires programmers to have some business-level skills: "How do I take Java programming skills and get a collaborative result?"

Which types of companies do you see investing in these emerging technologies and for what purpose?

Morgan: Pretty much every single company out there will find [real-time data access] the key to success, but in no area is it more notable than in financial services.

If you were a portfolio manager and wanted to evaluate the history and qualifications of a particular fund across any number of variables, that's information you would want immediate access to. When the market shifts, the ability to quickly give traders information to execute a trade could literally mean the difference of millions of dollars.

Beauchemin: You have to look at companies with innovation written all over them. Clearly airlines, financial institutions and e-tailers have been advanced users of technology. WAP technology could be useful for anyone from a railroad to a high-tech company. Peer-to-peer networking would be

useful to a manufacturer with a large supply chain.

How will training in these emerging technologies affect the IT worker's career?

Morgan: Certification and training are not necessarily the main criteria that these companies use to evaluate candidates. Companies are looking for people with practical experience, even if it's somewhat limited.

People with good technical skills can parlay their existing skills and adaptability and ascribe personality into opportunities like these. If they do, they won't be sorry.

Beauchemin: It's one thing to have the technology whereabouts. It's much better to be able to transfer that technology and translate it into valuable business propositions.

Do you have any suggestions for IT workers who want to identify emerging technologies and get training to poised themselves for a career boost?

Morgan: When looking for a job, people need to be willing to compromise a little bit in terms of the total package they're seeking [in order to gain experience with these new technologies]. If they do, there will be tremendous opportunities down the road, and doors will open for them. It's a short-term sacrifice for a long-term gain.

Beauchemin: The challenge with emerging technologies is that training may or may not exist for them.

If you try to look today at peer-to-peer computing, there are no books written about it at this moment. It takes a person with curiosity and the mind to look at the technology and see how it's appropriate for the enterprise.

They have to be up on the Internet and read specialized magazines and do a lot of research in their spare time on, for instance, how well electronic bill presentation technology works. ■

Brandel is a freelance writer in Newton, Mass.



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IT Careers/ Skills: JAVA

Java is a programming language that is used in many different industries. It is used in the financial industry, the automotive industry, the Internet, and many other industries. Java is a popular language because it is easy to learn and use. It is also a powerful language that can be used to build complex applications. Java is a great language for business because it is a reliable language that can be used to build complex applications. Java is a great language for business because it is a reliable language that can be used to build complex applications.

Alan Snyder, president and CEO of Ideas Integration, says his firm continues to have strong demand for the mission critical project solutions. "Our folks provide functional analysis, programming, architecture and development for delivery of a solution so it represents a strong opportunity for those who know custom application development, business intelligence and have industry expertise. A core fundamental is JAVA, an open language that allows our clients to use multiple vendors. It's a language information technology can coalesce around."

Ideas Integration, based in Jacksonville, FL, is a division of Modis Professional Services, as is

Modis, Inc., based in Jacksonville, FL. Modis' President and CEO Jack Cullen, says his firm is providing staff augmentation and consulting primarily to Fortune 500 companies. "I've been in the IT industry since 1985, and I've found that the most secure job is that of a consultant and right now a consultant who has JAVA skills. Our clients continue to need JAVA skill sets, so we anticipate growth within this sector of 10 to 15 percent for the year."

Snyder notes that individuals who have the strength of JAVA skills with some level of architecture knowledge and industry experience are hard to beat. "It's a great combination of standards-based, open system architecture that makes a person very valuable," he explains. "JAVA is well-suited for large-scale architecture and as a tool for integration. Businesses are continuing to spend money on data management and anything that can assist in generating revenue or savings."

Cullen says clients continue a heavy migration toward the Internet. "In addition, we're seeing continued high demand for conversion experience and that requires JAVA HTML, JAVA Beans and JAVAWC++." We also are careful about getting to know you personally so that we know whether you are more suited for deal-

ing with clients and their customers or cranking code and working the project."

Modis offers continuous training and provides opportunities to migrate to entirely new projects. "We offer employees a wide base of experience and wide geography. We're concerned with your future, not just brokering your skills," says Cullen.

At sister organization Ideas Integration, Snyder says the firm is interested in building long-term relationships with people. "We want to offer the best complete package to employees – compensation but also work/life balance and training. We've come to realize there is no single silver bullet to making employees happy. It requires a holistic approach that is based on strong technical challenges and the kinds of projects that allow individuals to grow and stretch."



For more job opportunities with firms using JAVA, turn to the page of **Java**.

- If you'd like to take part in an upcoming **Java** feature, contact Julie Crowley, 650.312.6467 or julie_crowley@infoworld.com.
- Produced by Connie R. Holden

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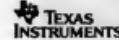
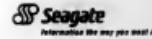
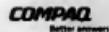
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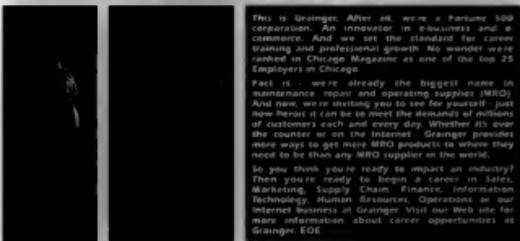
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NEWS

Continued from page 1

Oracle

in place in the U.S., offering customers a choice of only named-user licenses or licenses based on processor speed, known as the Universal Processor Unit (UPIU).

On the matter of whether the price cuts in Japan will be followed by lower prices in the U.S., Wendell Laidley, an analyst at Credit Suisse First Boston's Technology Group in

San Francisco, said it's too early to tell. "I have to believe that there's some consistency between Oracle Japan and the rest of the world," said Laidley. But, "I don't know," he said.

Another analyst in the U.S. who was scheduled to receive a nondisclosure briefing from Oracle executives on pricing issues Friday, said Oracle canceled the briefing at the last minute.

Kristin Krysway, an Oracle spokesperson, indicated that Oracle's headquarters was uncertain of the specific actions

of its Japanese unit. That unit is majority-owned by Oracle, but it's an independent operating company, she said.

"They did put out a press release, but it's in Japanese and we don't know what it says," Krysway said. "We're working on getting it translated."

Krysway added that Oracle hasn't announced any changes in the U.S. and declined to say whether pricing changes are forthcoming here. But Laidley said he recently spoke with top Oracle executives about the changes in Japan.

In contrast to the negative reaction that the UPU pricing structure has drawn in the U.S., where many Oracle database users have complained publicly about what they consider to be exorbitant pricing that in some cases has led to project delays and cancellations, customers in Japan have responded positively to the new pricing, according to the Credit Suisse report.

The reductions in Japan demonstrate "a sensitivity and a willingness to be responsive" to the needs of users, Laidley said. "I think they're trying to

be responsive to customer concerns that appear to have become more widespread over the last month."

Raymond LeFebvre, manager of database administration at The Stride Rite Corp. in Lexington, Mass., said that from a user perspective, it's imperative for Oracle to become more competitive on the pricing front and not just on the technology front. "If they follow suit in the U.S., they will do users a big favor," said LeFebvre. "This is important that they do this [Microsoft's SQL Server and IBM's DB2] are becoming more scalable and very easy to install and maintain."

Carl Olson, an analyst at IDC in Framingham, Mass., said any announcement of price reductions in Japan or elsewhere will likely "intensify pressure in the U.S." to do the same. "Larry Ellison's a smart guy and he's not going to let a policy stand in the way of making money," Olson said. ■

Continued from page 1

OAUG

Network NV. "When you are discussing and trying to resolve a difference, you don't walk out the door and ... tell everyone what you discussed. Certainly, I don't."

OAUG has declined to hold its events under the Oracle umbrella, claiming that doing so would compromise the openness of the events and make them more focused on marketing.

Oracle this year hosted its own Oracle AppWorld conference, diverting resources and personnel from the OAUG's events and causing considerable friction between the two groups.

The feud intensified last week when Oracle posted details about its proposal to the OAUG on its Web site, along with a copy of a letter sent to OAUG officials and an online poll seeking input on the matter from rank-and-file users.

Oracle had included various sweeteners in the proposal, including an offer to designate an "OAUG Day" at each conference and to let the independent group manage the "user content" of the events.

The OAUG rejected the latest offer, which it claimed sounded like the proposal OAUG

made to it last year. Moreover, Young said, "I am forced to wonder whether Oracle [is] really negotiating in good faith in this matter."

Young said the OAUG's board feels that a compromise could be reached if Oracle agreed to send about 60 developers to lead technical sessions at the user group's next conference, due to take place in San Diego in September.

One choice is that there is a joint conference. The other is that there is an independent one. The choice not on the table is an independent conference that's dependent on Oracle," said Mark Jarvis, Oracle's chief marketing officer. Jarvis also criticized the OAUG board and defended Oracle's decision to go public with the talks.

"I don't know what [Young] means by private negotiations," he said. "This is between Oracle and its users. The reason why we're [going directly] to users is simply that, in the past, it has been clear to us the user group board has miscommunicated to [its] members."

Jarvis said the vendor wants to limit the number of conferences related to its applications, partly for economic reasons. "This is not just an Oracle issue," he said. "It also involves Oracle's [business] partners. These companies cannot afford to go to seven conferences."

Continued from page 1

Itanium

They include Dell Computer Corp., IBM, Hewlett-Packard Co. and Compaq Computer Corp., which are all slated to start shipping Itanium boxes in mid-June.

Itanium is the name for Intel's next-generation 64-bit processor family as fast as the first chip in that new generation. Work on the technology began in June 1994, when Intel and HP announced joint development agreement to design a generation of processors that would be capable of running high-end 64-bit-based applications and Unix applications equally well.

Itanium processors at one point were expected to ship as early as 1999. Intel claimed that it underestimated the time it would take to develop a processor architecture of this

scope, though there have been previous reports of design glitches and problems in the manufacturing process.

The chips are based on a new design called Explicitly Parallel Instruction Computing. The design implements features called predication, speculation and explicit parallelism that significantly boost performance over existing CISC and RISC-based processor architectures, said Intel.

Such features, combined with full 64-bit addressing, large memory support, increased floating-point performance and high memory bandwidth, make Itanium a good platform for large server and workstation applications, according to the company.

The National Center for Supercomputing Applications (NCSA) at the University of Illinois at Urbana-Champaign plans to install a cluster of 160 IBM Itanium-based Intellistation workstations because

of the enhanced performance, said Dan Reed, director of the NCSA. "It's early in the path, but so far, the performance we have seen has been spectacular," Reed said.

The NCSA has been testing Itanium systems for a year.

"It has been really excellent performance on even early hardware," agreed David Lishka, chief technical officer at the Cornell Theory Center, which plans to install a 128-processor Dell Itanium cluster to power research applications at Cornell University in Ithaca, N.Y. "We have seen it outperforming late-generation RISC architectures" on certain applications, he said.

But most corporate users will have to wait until Itanium's successor, known as McKinley, starts shipping sometime next year before they can begin to tap such performance. That's at least how long it is going to take for all of the pieces to be come available. ■

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FRANK HAYES FRANKLY SPEAKING

Encrypt Everything!

ALL RIGHT, why doesn't everyone encrypt e-mail? Last week, word got out about a draft report from a committee of the European Parliament regarding Echelon, the National Security Agency's (NSA) system for eavesdropping on telephone calls, faxes and e-mail messages (see story, page 20). In the leaked report, the committee urges businesses and even ordinary citizens to encrypt all e-mail to protect it from unauthorized snooping.

So why don't we? Why aren't we routinely using encryption on everything we send out on the Internet already? Short answer: Because we don't believe we need it.

Really, we don't. Oh sure, those cranky old guys in the glass house probably think encrypting everything is a good idea. They've been fanatical about data security on the mainframe for decades. They're the ones who now refuse to let their precious data past the firewall unless it's on a virtual private network.

But the rest of us? We just don't see why. We know millions of people send unencrypted e-mail every day. We know credit card numbers are almost never actually stolen using sniffers, and the likelihood that a cracker or industrial spy could tap critical information from that firehose of a bistream is almost nil. We know the Internet has grown to become the backbone for e-business without much encryption. We figure: Why worry about it now?

Sure, we hear about the NSA's Echelon and the FBI's Carnivore. Maybe we've even got hot and bothered about them. But hey, those systems are aimed at crooks and foreigners, right?

Besides, encryption is inconvenient for users. And our customers and business partners might not use the same crypto system we do. And someday, all the vendors will likely get together and give us a universal standard for e-mail encryption. In the meantime, why fix what's not broken?

Because it's broken, that's why — and it's long past time to fix it. The cranky old data center guys are right: Data security really does matter. And we should never have gone so far down this road leaving so much data unprotected.

The Internet today is a huge security hole for our systems. It's the one place where our data is exposed to the outside world. Every-

thing else, from the heart of the data center right out to the edge of our networks, is secured. But out on the Internet, it's not.

Have we gotten away with ignoring that security hole so far? Yes, mostly. But how long can that last? We could probably leave the back door to the computer room unlocked for a while too, but it would still be crazy.

We can't plead ignorance of the risks, not anymore. Officially, U.S. agencies refuse to admit Echelon even exists, although its existence and function have been confirmed by former NSA employees. But former CIA Director James Woolsey has publicly acknowledged that the U.S. spies on non-U.S. businesses "to unearth cases of bribery and sanctions violations," he told a press conference last year.

If we can do it to them, their countries can do it to us. And what government spooks can do now, private spies will be doing soon. Even if we believe the Internet is safe today, we should know it won't be tomorrow.

We can't really believe encryption is too mysterious or technically complex for us to implement. Financial organizations have used it for decades. Teenagers who download PGP use it every day. If we can't handle this, we're in the wrong business.

And we know we can't wait for e-mail vendors to implement universal crypto when they get around to it. What we don't push vendors for, we won't get.

The time is now. The technology is there. The need is clear. Which really just leaves one question: Why aren't we encrypting e-mail? ■



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SHARK TANK

COLLEGE PROFESSOR complains that some documents run off the right hand side of the page when he prints them out. "Change the page orientation, from portrait to landscape," IT pilot fish suggests. "I thought about that," says prof. "But my printer doesn't let me put the paper in that way."

IT READS FINE IN GERMAN All U.S. employees of the German software company receive a pamphlet with the eye-catching title, "Job Safe?" That makes them nervous — until they realize the pamphlet just details security measures for protecting company data during program runs.

PROJECT TO REWRITE standard consortium's Web site scratches on and on, so IT learns whimsically names the staging area, "Geysiphat," since it seems this rock is never going to get up. "It's always moving," says marketing pilot fish. But he conges when the site literally goes live and all the Web address will have "mynphus" in them. "Since a complaint many people have about making standards is that it takes forever to do, it puts us in a bad light," fish argues. IT guys don't get it.

but the boss does. The server's name is changed.

USER HAS PASSWORD trouble, so she calls tech support pilot fish. He watches while she types ***** for her password. "No," says fish. "You have to type in your assigned password." Sighs user. "But when I type in it, it just looks like asterisks anyway. I thought six stars would be easier to remember."

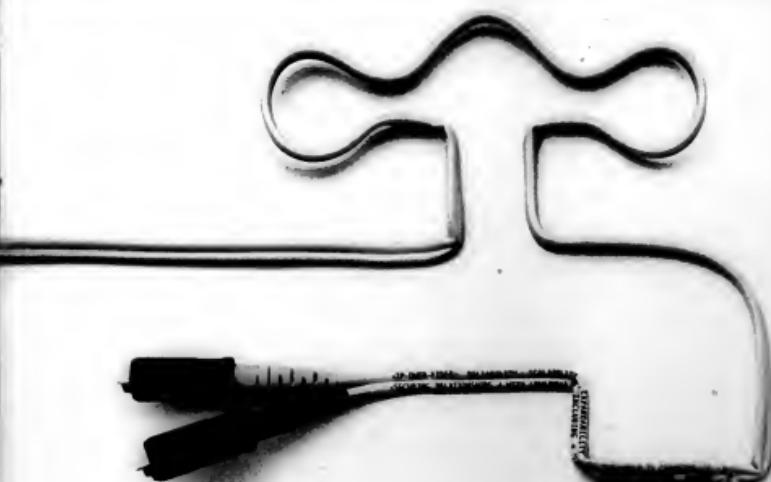
ARCHITECT PILOT FISH working on a bank heliway across the country gets a call from the bank's project manager, who wants to see the current floor plans immediately. Manager has trouble opening e-mail attachments, so he wants the plans faxed. Fish tries, but the line is busy. He tries again and again — still busy. Finally, he gets through to the project manager. Is the fax machine busy? he asks. It can't be, says the project manager. "I've got my laptop plugged into the line right now."

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The 5th Wave



"Would it ruin the online concert experience if I assumed the mesh jet between songs?"



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